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Healthcare has transitioned away from a focus solely on clinician-oriented evidence to include patient-oriented evidence or considering what is important to the patient. Patient-rated outcome measures (PROs) are one mechanism through which patient-oriented evidence can be obtained, and these tools have been implemented with athletic populations, both in practice and research. Despite documented relevance, athletic trainers (ATs) often fail to implement PROs in clinical practice. Obtaining information from ATs who use PROs may help promote wider use and improve clinical practice. Therefore, the purpose of this study was to learn how ATs use PROs in clinical practice, and the factors that influence implementation. A cross-sectional exploratory sequential mixed-methods design was used with an online survey and individual phone interviews. Credentialed, practicing ATs in post-professional athletic training programs (Masters, Doctorate in Athletic Training, and Residencies) were invited to participate in the study via email sent to program directors. Secondary recruiting of ATs occurred through direct contact and snowball techniques with ATs. ATs from varied clinical settings and all 10 NATA districts participated in the study. An online survey, modified with permission from the original authors (Lam et al., 2019) was administered via the Qualtrics platform. The 37-item questionnaire consisted of a combination of Likert scale questions, other objective items and open-ended questions. A link was provided at the survey's conclusion for ATs interested in completing an interview. Descriptive statistics were calculated for Likert and objective items to determine frequencies and central tendencies related to PRO use. Open-ended items were coded along with interview transcripts to learn AT perspectives on PRO use. Trustworthiness was ensured with member checking of interview transcripts prior to analysis. Results indicate that ATs are using a

variety of PROs, administered through several mediums with both surgical and non-surgical cases throughout the continuum of patient care. Even though ATs are seeking patient perspectives through dialogue, wider use of formal PRO instruments is needed. Improved patient outcomes and clinical decision-making, clinician education, and obtaining patient perspective are factors influencing PRO use. Without the use of PROs in clinical practice, ATs continue to rely on mostly clinician-based evidence. If PRO use is to increase among ATs, the perspectives of peer ATs using PROs in clinical practice is paramount to facilitate the development of best practices for PRO use in athletic training.

PATIENT-RATED OUTCOME MEASURES IN ATHLETIC TRAINING: AN EXPLORATORY STUDY

by

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Approved by

_____
Committee Chair

This project is dedicated to all of those who have influenced my life by contributing to the completion of this educational journey. Some, like family, friends, doctoral peers who have become lifelong friends, and colleagues, supported me and cheered me to the finish line. Others, like my mom and brother, weren't able to see me take this step. Nonetheless, they I know they were still cheering for me. To my mom especially, I am grateful for the confidence you instilled in me through your own perseverance and for giving me the freedom to spread my wings.

APPROVAL PAGE

This dissertation written by Beverly R. Justice has been approved by the following committee of the Faculty of The Graduate School at The University of North Carolina at Greensboro.

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CHAPTER I

PROJECT OVERVIEW

Healthcare has transitioned away from a focus solely on clinician-oriented evidence to include patient-oriented evidence or considering what is important to the patient. Health care professionals, including athletic trainers, are expected to implement evidence-based practice (EBP) as a means to improve outcomes for their patients. Both benefits and barriers to EBP in health care exist and have been documented across many health care disciplines. Considering the patient at multiple levels is of paramount importance for EBP. The International Classification of Functioning, Disability and Health (ICF) model, adopted by many health care disciplines, serves as the foundation for EBP. Measuring outcomes is also considered an essential element of EBP because the patient's perspective is included. Patient-rated outcome measures (PROs) are the tools used to measure success and have been implemented with athletic populations, both in practice and research. As contemporary health care providers, athletic trainers (AT) must consider their patients' values in order to achieve optimal outcomes. Despite the documented relevance, ATs largely fail to implement PROs in clinical practice.

Background Literature

Patient values are one of three components of evidence-based practice (EBP), a concept which originated in the early 1970's (Law & MacDermid, 2014). During this same era, Nagi (1965) created the first disablement model that served to describe disability as multi-contextual; disability considers both environmental and societal effects of injury/illness. Accentuating what matters most to the patient is a benefit of using disablement models in clinical practice (Snyder et

al., 2008). The World Health Organization's ICF model serves as the foundation for obtaining patient evidence while considering the multiple contextual factors of disablement (Van Lunen et al., 2015). The National Athletic Trainers' Association (NATA) adopted the ICF model of disablement in 2015 to provide a common language and method for discussing, documenting, and tracking outcomes related to athletic training practice (Nottingham et al., 2016).

Patient-rated outcome measures (PROs), self-report measures of any aspect of a patient's health, are the mechanisms through which patient-oriented evidence can be obtained. Examples of these measures can be rating pain, asking how an injury/illness is affecting the ability to climb stairs, and asking what types of activities are impacted by the injury/illness. Unlike functional assessment from a clinician-based perspective, patient-oriented evidence can be collected at any point during patient care, such as during the initial assessment, at discharge, and later during a designated follow-up period (Valovich McLeod et al., 2008) and would come directly from the patient.

ATs have historically had a limited approach to clinical assessment, focusing on patient impairment and function (Snyder et al., 2008) and therefore, have limited appreciation for the patient perspective (Howard et al., 2018). Optimal outcomes and long-term quality of life can be sacrificed if traditional performance-based measures of function are the sole criteria used for patient assessment (Werner et al., 2018).

Patient-Rated Outcome Measures in Athletic Training

Despite evidence supporting the value of PRO use in athletic training, research to date has shown low percentages of PRO use by ATs (Coulombe et al., 2019; Hankemeier et al., 2017; Lam et al., 2019; Snyder Valier et al., 2014). Snyder Valier et al. (2014) reported only 26% of ATs surveyed use PROs in clinical practice and only 4% of those had intentions to use PROs in the future. Coulombe et al. (2019) reported 15% of secondary school ATs use PROs, and Lam et

al. (2019) reported 21.7% of ATs use PROs. Only 8% of ATs not using PROs have cited lack of training as a barrier (Snyder Valier et al., 2014). Lack of support, irrelevance to patients and unworthy effort have also been identified as barriers with too much patient completion time being the most commonly cited barrier across multiple studies.

Research findings suggest lack of familiarity and training are barriers to PRO use by ATs and other health care providers (Duncan & Murray, 2012; Hankemeier et al., 2017). Lack of knowledge about PROs was a major influence on their use for clinicians in one systematic review (Duncan & Murray, 2012). At least 68.3% of ATs were not at all familiar with generic PROs and at least 65% were not at all familiar with condition-specific PROs (with the exception of the measure used to evaluate concussions) (Hankemeier et al., 2017).

Both published research and clinical guidelines emphasize the role PROs can play in the AT's clinical decision-making. For example, PRO use was important in predicting the number of days to return to sport following acute lateral ankle sprains (Cross et al., 2002). Likewise, the most recent NATA position statements on patellofemoral pain (Bolgla et al., 2018) and Superior Labral Anterior-Posterior (SLAP) injuries of the shoulder (Michener et al., 2018) include the use of PROs in the management of the targeted illness/injury. These recommendations are based on current evidence and are intended to guide the AT in treating injuries and/or illnesses commonly seen in their patients. In each case, recommendations are provided in which the AT would use one or more PROs in making return to play decisions following these injuries.

Unfortunately, those studies and guidelines have had little impact on PRO use in athletic training. The perceptions of allied health professionals need to be studied further to identify factors that influence routine use of outcome measures (Duncan & Murray, 2012). Specific to athletic training, the perspective of those ATs who do utilize PROs in clinical practice may provide insight into factors that influence effective use of PROs.

In the last 10 years, a great emphasis has been placed on patient-centered care, the use of disablement models, and the use of PROs in athletic training clinical practice. Evidence of this emphasis can be found in published textbooks specific to EBP in athletic training, a prolific increase in peer reviewed journal articles, editorials, and commentaries on these topics, and a strong presence of these topics at state, district, and national athletic training symposia.

An interrelationship exists between disablement models, the patient-oriented evidence that matters, and the information provided by PROs. It is difficult to develop meaningful, patient-centered goals without the use of PROs (Evans & Lam, 2011). Remembering that patient-centered care is an expectation for healthcare providers, the framework for clinical practice should come from the disablement model while the PRO provides the mechanism for measuring success of the patient outcome (Valovich McLeod et al., 2008).

Failure to implement PROs may ultimately affect patient outcomes and the success of the health care intervention. Because of their potential ability to facilitate change behavior for patients, clinicians, managers and policymakers, PROs have some distinct advantages over traditional clinical outcome measures (Kyte et al., 2015). Specific benefits reported in the literature include facilitating patient-client communication in shared decision making, improving patients' satisfaction with health care, improving patients' adherence to prescribed treatment, a standardized means to monitor disease progression, and even a strategy for quality improvement (Ayers et al., 2013; Elsenbeck et al., 2018; Hankemeier et al., 2017; Kyte et al., 2015; Valderas et al., 2008).

An understanding of current use and therapists' perceptions of PRO use is needed for the best promotion of PRO measures in clinical practice (Valdes et al., 2014). Previous PRO research in athletic training has identified both benefits and barriers to PRO use but research has not adequately addressed the experiences of ATs who do implement PROs in clinical practice.

Learning such information as implementation methods, impacts on clinical decision-making, and whether PRO use affects patient outcomes may positively influence other ATs in the use PROs. This perspective is critical if PRO use among ATs is to see significant growth.

Purpose Statement

The purpose of this study is to learn how athletic trainers use PROs in clinical practice, and the factors that influence implementation. The study's aims are as follows:

Aim 1: Determine how athletic trainers use PROs in clinical practice.

Aim 2: Determine what factors influence the use of PROs for athletic trainers in clinical practice.

Aim 3: Determine how PRO use affects clinical decision-making and patient outcomes.

Methods

An exploratory sequential mixed methods approach was used that included the completion of a questionnaire followed by individual interviews to learn the perspectives of athletic trainers.

Participants

The target population for this study was credentialed ATs currently engaged in clinical practice. Credentialed ATs are those who are in good standing with the Board of Certification, Inc., the profession's regulatory agency, as well as their respective state regulatory agency, if applicable. These ATs may practice in a variety of clinical settings, including secondary schools, colleges and universities, professional sports, clinics and hospitals, physician practices, tactical settings, industrial work sites, and with entertainment groups.

Seventy-nine ATs, with a mean age of 28.98±8.90, consented to participate in the study. One response was not included in the analysis as the respondent indicated no use of PROs. Of

the 66 ATs who completed the survey, 63.6% (n=42) identified as female and 36.4% (n=24) as male. The majority of respondents reported clinical experience of 5 years or less; 57.8% of ATs (n=38) reported less than 3 years clinical experience while 12.8% (n=8) reported 3-5 years of experience. Of the remaining participants, 7.6% (n=5) reported 6-10 years of experience, 13.6% (n=9) reported 11-20 years of experience and 9.1% (n=6) reported 20 or more years of experience. All of the 10 NATA districts were represented by at least one participant, with most practicing in District 6 (Southwest Athletic Trainers' Association) (n=19), District 4 (Great Lakes Athletic Trainers' Association) (n=16) and District 3 (Mid-Atlantic Athletic Trainers' Association (n = 11). Practice setting of participants was similar to that of all ATs, with higher percentages practicing in colleges/universities, secondary schools, or clinics/hospitals (NATA, 2019). Forty-one percent of ATs (n=27) reported practicing in the college/university setting while 39.4% (n=26) reported practice in the secondary school setting. Participants also reported working mostly with athletic/physically active populations (37.1%, n = 52), adolescents (23.6%, n = 33), and adults 18-64 years of age (37.9%, n = 39).

Participants who completed individual interviews had also completed the survey. Of the 7 individual interview participants, 2 ATs practiced in a college/university setting, 1 AT practiced in a physician office, 1 AT practiced with professional sports, 1 AT practiced in the secondary school setting, and 1 AT practiced in a clinic setting. One additional interview participant was not practicing currently but had previously practiced in a college/university setting.

Measures

Survey. A survey consisting of multiple choice, multi-select and Likert scale items was used to collect data along with open-ended survey items and individual interviews. The survey to determine how ATs use PROs in clinical practice was adapted from Lam et al. (2019). The original survey asked about PRO use for eight body regions and included an extensive list of PRO

instruments for each region. Three questions were asked about each individual PRO instrument: the percentage of patients for which the instrument was used, the type of injury (acute or chronic), and the severity of the injury (mild, moderate, or severe). In adapting the survey for this study, only seven body regions were included and the three individual questions about each instrument were removed. In order to obtain the views of participating ATs, a text-entry item was included in the introduction that asked for a PRO definition or interpretation. Immediately following, a standard definition was provided as a common guide for the remainder of the survey. As a reminder, the standard definition was repeated twice more at the beginning of new sections. The final modified survey consisted of 37 items divided into four categories: introduction, demographics, PRO implementation, and influencing factors (Appendix A).

Demographic information included age, race, gender, years of experience, practice location (district), practice setting, and patient population. PRO implementation items included how often PROs are used in clinical practice, methods of administration, types of medical cases for which PROs are used, and the identification of specific, generic, and single-item measures used. Additionally, participants were asked to report the percentage of time using both clinician-based outcomes and patient-rated outcomes as well as how these measures are combined in clinical practice.

Additionally, three Likert scale items on the survey asked participants about the importance of PRO selection criteria, the degree to which various knowledge sources contributed to PRO use, and the degree to which various other factors influenced PRO use on scales from *not at all important* to *extremely important* or *none at all* to *a great deal*. Via open-ended survey items participants who indicated their PRO use had changed in the last 5 years were asked to explain the change. Data gathered from other open-ended survey items included the reasons for PRO use and how clinician-based outcomes and patient-rated outcomes are combined. Lastly,

both the survey and the interview asked ATs about challenges encountered with PRO implementation.

Interviews. A semi-structured guide with 12 questions was created for the individual interviews (Appendix B). Each question was designed to supplement and provide richer information than was captured in the survey responses. The first question was an icebreaker asking participants to describe their position as an AT along with the population of patients in their care. Two questions focused on the ICF Model of Disablement and how participants incorporated its components into clinical decisions. Participants were then asked to provide perspectives on PROs, including a definition, implementation strategies, perspectives on how the information provided by PROs differs from that provided by clinician-based evidence, how patient outcomes are affected by PRO use, and challenges encountered with PRO use. Finally, participants were asked about factors contributing to PRO use in their clinical practice.

Procedures

Following approval of the Institutional Review Board (IRB) at the University of North Carolina at Greensboro (UNCG), advanced practice programs offering the post-professional masters, the Doctorate of Athletic Training, and residencies in athletic training were identified for recruitment of participants. Thirty-seven post-professional programs with cohorts of varying size were identified. Recruitment emails (Appendix C) containing the participant script (Appendix D) and survey link were sent to 25 program directors where site approval was granted or confirmation was received that no approval was needed.

Additional recruiting strategies received IRB approval and were implemented to increase participation. First, practicing ATs who were either current students or alumni of a doctoral program in Kinesiology were identified. A final strategy involved identification of practicing ATs employed by health care networks or physician practices in North and South Carolina. All

ATs identified in the additional recruiting strategies received an email containing the participant script inviting them to participate in the study and/or share the invitation with colleagues.

The survey was administered in Qualtrics (Qualtrics, LLC, Provo, UT). At the survey's conclusion, participants were invited to participate in a focus group or individual interview via a Google form. Only individual phone interviews were conducted as there were not sufficient numbers for a focus group. Initial contact for interviews was made by email to determine a mutually agreeable day and time. Once confirmed, an image of the ICF model of disablement was emailed to interview participants for review prior to the interview. Verbal consent was obtained at the start of each interview and participants provided consent for recording of the interview. The interview then began using the semi-structured interview guide, with follow-up questions to gather additional information or for clarification.

Data Analysis

Once the survey was closed, the results were exported to SPSS (version 23; IBM Corp, Armonk, NY) for analysis. Analysis of close-ended items involved the use of descriptive statistics. Frequencies were calculated for survey items related to participant demographics, multiple choice and multi-select items related to PRO implementation and use of PRO tools. For survey items that used a Likert scale, means and standard deviations were calculated.

Open-ended survey item responses were exported into a Microsoft Word document for analysis. Seven interviews were completed and audio recorded. Recorded interview files were uploaded to Otter.ai (AISense Inc., Los Altos, CA) for transcription. Each transcription file was then sent to the interviewee for verification and member checking. Once verified, transcription files were uploaded to Atlas.ti (ATLAS.ti 8 Windows) along with the responses from the open-ended survey questions for coding and detection of themes. Further credibility of the qualitative data was established by discussing the analysis with another AT colleague.

Each interview transcript and open-ended survey response was read in its entirety and then coded by the researcher. All interview and open-ended survey responses were coded in Atlas.ti using open coding by attaching identifiers to responses deemed relevant to the study (Bloomberg & Volpe, 2016). Then, keeping the study's conceptual framework in mind, categories were developed by creating groups of similar codes. This resulted in 8 categories which were then stratified to determine with which study aim they best aligned. Final synthesis of these data was conducted by conducting queries in Atlas to determine common quotations within categories.

Based on the mixed methods sequential explanatory design, the qualitative data added insight to the quantitative data (Pitney et al., 2020). As such, different pieces of quantitative and qualitative data were triangulated to answer each of the study's aims. A graphic depiction of the process for the qualitative data analysis can be found in Appendix E.

Results

Survey responses on PRO implementation are presented first followed by survey results on factors that influence PRO use. Open-ended survey responses and interview results that provided more insight into ATs' use of PROs follows. Interview participant names have been changed to protect anonymity.

PRO Implementation

Of the 58 participants who reported frequency of PRO use, 51.7% (n=30) reported sometimes, 12.1% (n=7) about half the time, 17.0% (n=9) most of the time, and 13.8% (n=8) always. Seventy percent of participants (n=41) reported using PROs with both surgical and non-surgical cases while 23% (n=12) reported use only with non-surgical cases and 7.7% (n=4) reported use only with surgical cases. Most athletic trainers reported using specific PROs for longer patient cases, such as post-surgery. As stated by Bethany, "We do use the Dash or

Oswestry or IKDC, depending on the injury for our longer-term rehab, typically post-op, things like that". As Table 1 shows, verbal was the most common method of administration of PROs, either as the sole mode of administration or in combination with pen and paper.

> And then we do send out surveys. So normally, patient-reported outcomes. So, through mychart account or through a paper survey or through a tablet that we give them in clinic. (interview with Dylan)

Table 1

Methods of PRO Administration

	n	%
Electronically	3	5.5
Pen/Paper	11	19.6
Verbally	14	25.9
Electronically and Pen/Paper	2	3.7
Electronically and Verbally	4	7.4
Pen/Paper and Verbally	15	27.7
Electronically, Pen/Paper and Verbally	7	12.7

N=56

Among survey respondents, the Lower Extremity Functional Scale (LEFS) was the most commonly reported specific PRO used for the foot/ankle, knee, and hip regions (n=21, 27, 19 respectively). The Foot and Ankle Ability Measure (FAAM) was used by 32% of respondents while the Foot and Ankle Disability Index (FADI) was used by 28%. The Knee Osteoarthritis Outcome Score (KOOS) was the most common knee-specific measure used with 26.4%. However, a significant percentage of participants reported they do not use specific measures for the foot/ankle (36%, n=18/50), knee (32%, n=17/53), hip (45%, n=23/51), and back (46%, n=24/52). For those that did use specific measures for the back, the Oswestry or Modified Oswestry Disability Index was the most common instrument (n=19/52).

Twenty-nine percent of respondents (n=15) reported they did not use specific measures for the shoulder and elbow. For those that did, the Disabilities of the Arm, Shoulder, and Hand

(DASH) and Quick DASH instruments were used most commonly by 47% of ATs (n=25 for both instruments). Similarly, these same instruments were used most commonly for the wrist and hand. Thirty percent of respondents reported using the DASH while 38% reported using the Quick DASH. However, the nearly half of ATs (n=53) reported no use of specific measures for the wrist and hand (49%). The Neck Disability Index was the most commonly used specific measure for the neck region, with 26.4% (n=14/53) of ATs reporting use. However, PROs were reported to be used less frequently on this region than any other, with 60.4% of ATs (n=32) reporting they did not use specific measures for the neck.

The use of generic PROs was varied with the ShortForm-12 or Short Form-36 used most often (48%, n=15/31), followed by the Musculoskeletal Functional Assessment scale (29%, n=9/31), the Disablement of the Physically Active Scale (DPA) (26% , n=8/31), and the Short Musculoskeletal Functional Assessment tool (26%, n=8/31). For single-item measures, the Numeric Pain Rating Scale was used by 89.8% of ATs (n=44/49), making it the most commonly used PRO in the study. The Global Rating of Change Scale (32.7%, n=16/49) and the Patient-Specific Functional Scale (22.4%, n=11) were less commonly used single-item measures. A more detailed reporting of specific, generic and single-item measures can be found in Appendix F.

> I generally use...sometimes it's region-specific, other times it's single question. I mean, I use a variety of different patient-reported outcome measures to ensure that I'm gaining this type of...at least the environmental factors information. (interview with Griffin)

The point of care at which ATs implemented patient-rated outcome measures varied. (Table 2). The mean percentage of time ATs reported using clinician-based outcomes (59.5±31.73, range 0-100) was greater than the mean percentage (43.2±29.8, range 0-100) for using PROs . While the ATs relied on PROs less than clinician-based outcomes, 70% (n=35) did report their use of PROs

has changed (increased) in the last 5 years. Reasons cited for increased use included greater knowledge of PRO benefits and use.

Table 2

Point of Care for PRO Administration

	n	%
Initial Evaluation	4	7.5
Intervals Throughout Care	6	11.3
Discharge	0	0.0
Initial Evaluation and Intervals	6	11.3
Initial Evaluation and Discharge	2	3.7
Intervals and Discharge	8	15.0
Initial Evaluation, Intervals, and Discharge	29	52.7

N=55

Influential Factors

Analysis of both quantitative and qualitative data showed several factors affect PRO use. Quick completion time (50.0%, n=29) and Ease of patient understanding (53.4%, n=31) were most commonly reported as extremely important. Valid and reliable instruments were very important (50%, n=58), along with Ease of interpretation of scores (29%, n=58), and Appropriate for conditions in practice setting (53.4%, n=31). Post-professional athletic training programs (30%, n=15) were reported to be the greatest sources of knowledge affecting PRO use. ATs in the study also reported peer ATs (34%, n=17) and other health care professionals (27.1%, n=13) provided a lot of PRO knowledge (Appendix F).

When asked specifically about the importance of factors that influenced PRO use, ATs (n=50) rated numerous factors as extremely important. These included assistance with seeking patient perspective (46%, n=23), improvement of patient outcomes (44%, n=22), and improved clinical decision-making (40%, n=20) (Appendix E). The ability to improve communication with other health care professionals was rated as very important for 38% of ATs (n=19).

Two themes emerged from the qualitative analysis related to factors influencing PRO use: focus on patient values (Theme 1) and environmental contributors (Theme 2). The focus on patient values theme was derived from 2 categories: information provided by PROs and aspects of PRO use focused on the patient (Table 3). Two additional categories were used to create Theme 2: challenges and PRO facilitators (Table 4). Tables 3 and 4 contain the most common codes along with sample quotes for open-ended and interview data.

Table 3

Theme 1: The Use of PROs Results in a Focus on Patient Values

Category	**Codes**	**Frequency**
Information provided by PROs	• From patient's view • Feelings of patients • Ability to function • Direct feedback from patient • Evaluation of pain and symptoms	43 32 23 22 22
Supporting Quotes: So, I know for us, we ask specifically regarding sleep. We also look at pain on different activities they can do and can't do so we can assess those factors in someone's life and how the injury or pain is affecting them...and them being able to say it in their own words." (interview with Elliott) "Choosing treatment methods based not just on what the research shows or how well you think that they work, but instead on how much better or worse the patient feels following the treatment." (open-ended response) "So, I may say something like, you know, 'wow, you you...this looks so much better today.' But, the patient may not necessarily feel that way. I want the patient's response to those questions." (interview with Griffin)		
Patient-specific aspects of use	• Ability for patient to see progress • Patient satisfaction with recovery • What's important to the patient • Patient education	23 21 19 13
Supporting Quotes: "I would way rather know that you have less pain and dysfunction, then well, now you have full knee flexion and your quad strength is five out of five. So clinician-rated outcomes help me to say that like the targets of our rehabilitation are working. But, the patient doesn't care if they have full knee flexion and the strength is five out of five. They care if they have pain, and they wouldn't come and see me probably unless they have pain." (interview with Dylan) "For quality assurance with the patient that shows them the progress being made by their own marked scores to help educate the patient on the treatment." (open-ended response) "To gain the patient perspective about their progress during rehabilitation. Obtain objective data that is important to the patient." (open-ended response)		

Table 4

Theme 2: The Use of PROs is Affected by Environmental Factors

Category	Codes	Frequency
Challenges	• Time • Buy-in • Which instruments to use • Conduciveness of settings	32 19 10 9
Supporting Quotes: "...because not everyone fills them out ahead of time…So, then we have to give them a tablet in clinic to fill out and getting that done during the clinic can be challenging… and then each provider has different thoughts on how to utilize them and if they're useful or not useful. So, provider buy-in is a big one as well." (interview with Elliott) "Patient buy-in to using the tool (it is not perceived as a "normal" thing yet); TIME, particularly one-on-one time with an individual patient; familiarity and confidence implementing a tool effectively" (open-ended response) "1 - Time from the clinician and patient 2 - Selection of the correct measure for the given condition. 3 - Familiarity with each PRO 4 - Collecting too much data and knowing what to do with it all." (open-ended response)		
PRO facilitators	• Reasons for PRO use • Direct feedback from patient • Understanding value of PROs	56 22 14
Supporting Quotes: "So, I think the patient-rated outcomes, gives...gives subjective context to the objective measurements and can help. It can help tailor the participation, but it can also explain progress or regress, or some things like that or give context to progress or regress. So, I think that's where the value and really, as a clinician, you know, that that gets into less of the science and more of the art as a clinician. But it gives us the ability to interpret those subjective reports." (interview with Andy) "…just being kind of like I said, surrounded by people that put value into these patient rated outcomes and seeing the effect it has on you know, patients' treatments. It definitely has a positive effect and has kind of shown me the importance of such things as patient rated outcomes and how it can positively positively and force you know, efficient patient centered care." (interview with Chad) "I think the need for patient feedback. I think the need for communication. I think the need for me to evaluate my clinical practice, my rehab skills as part of that. I think the need to have every patient be an individual. Not just an ankle, you know, not just my list of ankle patients or whatever. Every patient should be individual and every treatment should be unique to that patient." (interview with Griffin)		

Impact on Clinical Decision-Making and Patient Outcomes

Responses to open-ended survey items and interview questions allowed the creation of three coding categories related to the impact of PRO use on clinical decision-making and patient outcomes: effects of PRO implementation, aspects of PRO use important to the clinician, and aspects of PRO use focused on the patient. These categories were combined to create Theme 3:

the use of PROs supports patient-centered care in AT clinical practice (Table 5). Codes with the highest frequencies as well as sample quotes are included.

Table 5

Theme 3: The Use of PROs Supports Patient-Centered Care in AT Clinical Practice

Category	**Codes**	**Frequency**
Effects of PRO Implementation	• Complementary function of CBOs and PROs • Conversation with patient/open dialog • Facilitates patient-centered care • Improved patient motivation	16 16 13 8
Supporting Quotes: "Because we get to know how they're feeling not just based off of physical exam or what we think the patient if, if everything comes clean on you know, physical exam and evaluation, but the patients still report that they're having persistent symptoms and any type of variance, then, you know, we take that into consideration and it affects the care that we give them versus just because they have a good physical exam." (interview with Chad) "So making them a part of their own care is I think that's the real catalyst for patient reported outcomes and just says why they're so important." (interview with Dylan) "Based on some of the initial CRO measurements and the PRO responses tracking and showing that progress to the patient is the best use of the combined results that I have utilized to this point. It helps to point out the actual numbers seen with their own values and goals noted to help continue to keep the patient motivated as well as continue to educate them on the purpose of the treatment and the injury itself." (open-ended response)		
Clinician-specific aspects of use	• Evaluate progression • Determine effectiveness of treatment • Drives programming • Determine discrepancies • Subjective views to numbers • Ability to track over time	33 30 23 19 17 16
Supporting Quotes: "…kind of connecting the dots of, you know, how the patient care is going: how they think it's going, how we think it's going, connecting those that putting a bridge between that to make sure that the patient is indeed, their symptoms are improving, and they are actually getting better versus, you know, keeping those two factors divided. Seeing that we're able to, we can see improvement, but we're, you know, you're not always sure that they can see improvement until you get those patient reported outcomes." (interview with Chad) "A patient-rated outcome measure is a validated, evidence-based way to make patient's subjective experience of pain, dysfunction, and satisfaction with care into an objective, quantitative number or score. It helps me to track patient improvement (or not) over time, often asks questions about daily life tasks that I wouldn't have asked, and helps to begin a discussion with patients about what is (or is not) going well during their treatment." (open-ended response)		
Patient-specific aspects of use	• Ability for patient to see progress • Patient satisfaction with recovery • What's important to the patient • Patient education	23 21 19 13

Supporting Quotes:
"I don't generally share my clinical based outcomes with my population because they don't care about things like goniometric measurements. However, I can use them in tandem with CROs when looking at positive improvement, saying things such as, 'you've had an increase in flexion/extension and your scores on (specific PRO) have also improved."(open-ended response)

"And then if there's some things that I'm seeing that could potentially help them in the areas that they're maybe not as satisfied with, talking about those things. And then also linking what we're doing in treatment and rehab to both the objective and subjective measures and explaining those things to the patient so that they understand we're doing this exercise to improve your range of motion. The reason we have to improve your range of motion so that you can actually do XYZ in your sport, ultimately. And I think not only does it give me a chance to identify areas that they feel like they're not improving in, I can then tie those things to the more objective potential causes of that. And then also explain those things to the patient because I think that knowing that is is beneficial, both physically and mentally to that recovery."(interview with Bethany)

Discussion

The purpose of this study was to determine how ATs are using PROs in clinical practice as well as the factors that influence implementation. This is not the first study to examine PRO use in athletic training. It is, however, the first known study to examine perspectives of ATs who use PROs. The findings support previous research, but add important AT perspectives on combining clinical and patient oriented evidence as well as how PRO use influences clinical decisions.

The sample of ATs in this study are representative of all ATs with regard to practice setting, but not experience. Participants in this study had fewer years of professional experience than samples in previous PRO studies (Lam et al., 2019; Coulombe et al., 2018). This is significant because 30% (n = 15/50) of the ATs in the current study cited post-professional athletic training programs as the greatest source of PRO knowledge. In contrast, 27.7% of ATs in the study by Lam et al. (2019) reported a Bachelor's as the highest degree earned, 7.3% had completed entry-level masters, and 45.5% had a master's in a related field. Only 15 % of ATs in the study by Lam et al. (2019) and 21.7% of the ATs in the study by Coloumbe et al. (2018) reported PRO use in clinical practice. This suggests education and/or formal training is more influential in PRO use than years of experience.

Overall, study results show common patterns of PRO use among ATs, yet the reasons cited for PRO use varies. With the LEFS and DASH being the most commonly used specific PROs in this study, these findings match those of Lam et al. (2019) who reported the LEFS to be used by 32.9% of respondents and the DASH to be used by 29.2% of respondents. Similarly, the Numeric Pain Rating Scale was also the most commonly reported single-item PRO (49.6%) and the SF-12 or SF-36 were the most commonly used generic PROs (36.5%) in this study. However, significant percentages of ATs reported no use of specific PROs, ranging from 29% for the shoulder to 60% for the neck. This suggests formal PRO instruments are not being widely used in clinical practice. Rather, many ATs are using conversations to collect patient-oriented evidence.

Despite the low use of formal measures, the themes derived from the qualitative analysis show PRO use does facilitate patient-centered care as well as a focus on patient values. Regardless of the use of formal instruments, ATs are seeking the patient perspective and using patient input to drive decision-making. Those using formal instruments are better able to convert subjective input into objective data to evaluate the effectiveness of treatments, determine progression, and further drive clinical decisions.

Environmental factors, the other theme derived from the qualitative analysis, may explain the lack of formal instrument use. ATs in this study, as well as others (Lam et al., 2019; Coloumbe et al., 2018; Snyder Valier et al., 2014), cited time as a barrier to PRO implementation. Tied to this is the setting in which most ATs practice: the sole provider or part of a multi-member staff for an entire athletic program. An additional barrier and challenge to PRO use is lack of buy-in, both from supervisors and patients. The implication is that some practice settings are more conducive than others for using PROs in clinical practice. ATs described the positive role that patient education can have on patient outcomes and patients need to be educated on the

role of PROs as well. While that could be viewed as another time barrier, some ATs feel it is worthy of the effort if it leads to increased patient satisfaction.

Perhaps more importantly, a cultural shift in athletic training clinical practice is warranted. ATs in this study who reported PRO use are more likely to be practicing patient-centered care. However, many of these clinicians are just beginning with PRO use as young professionals in clinical practice. There is no blueprint for PRO use and the appropriate PRO selection and interpretation of scores is complex. This presents a challenge that might be mitigated by organizational socialization in which newly credentialed ATs gain competence in PRO use by working with other ATs and medical providers in the same practice setting who value PROs (Pitney & Mazerolle, 2012). Several ATS in the study indicated PROs were highly valued in their workplace, which influenced their own use of PROs. Conversely, one AT indicated personal use of PROs had decreased because of lack of supervisor support in the workplace.

Professional programs in AT education must do more to provide students with a strong PRO foundation as 64% of ATs in the study felt their entry-level program contributed very little or none at all to their knowledge of PROs. This foundation requires more didactic instruction in the classroom and more clinical experience with PRO use. If preceptors are going to model PRO use for students, they, too, need a strong PRO foundation that could be provided through preceptor training. From the practicing clinician side, ATs need more opportunities to strengthen their PRO knowledge and skill as they reported continuing education sessions, printed materials, and web-based information contributed little to their knowledge. Peer learning and socialization in athletic training is a powerful contributor in AT clinical practice as 69% of ATs reported other ATs provided a lot to moderate amounts of PRO knowledge. More opportunities for peer to peer discussion are needed that would allow ATs to share PRO implementation strategies and talk

through challenges. Web-based webinars, in-person sessions at AT symposia, and even the creation of a listserv would be ideal platforms for this discussion.

In conclusion, ATs use a variety of techniques for administering PROs in clinical practice. While not all ATs are using formal instruments, they are seeking the patient perspective and understand the role of patient values in practicing EBP. Challenges exist with PRO implementation at the macro and micro levels. Future ATs must receive better education on the role and use of PROs and practicing clinicians must take steps to improve their use of PROs. Additionally, more research is needed to understand barriers to PRO use in athletic training as well as strategies to address the identified challenges with PRO use. Future research should include implementation studies using PROs in physically active populations as well as studies using more varied methods to gain greater insight into ATs' use of PROs in clinical practice.

CHAPTER II

DISSEMINATION

Dissemination of the findings will be through an existing online module (Appendix G) designed for preceptors affiliated with one or more professional athletic training programs. These preceptors are primarily ATs who work directly with athletic training students in providing clinical education and experiences. Perspectives of PRO use gleaned from ATs in the study will be added to existing content along with new content to provide examples of PRO implementation. The ultimate goal for adding this content in preceptor training is to increase PRO use among these ATs.

Increased PRO use is not only important from the clinical practice side of athletic training, it also has significant implications for AT education. As the *2020 Standards for Accreditation of Professional Athletic Training Programs* (Commission on Accreditation of Athletic Training Education, 2019) come into effect July 1, 2020, it is even more imperative as PROs have relevance to multiple standards. Standard 69 specifies use of PROs while the use of the International Classification of Functioning and Disability (ICF) model and patient values are specified in other standards.

All professional athletic training programs must provide clinical education for their students. Additionally, all clinical experiences must be supervised by a preceptor who is an AT or a physician (CAATE 2020 Professional Standards, 2019). Programs seek athletic trainer preceptors who work in various clinical settings, including secondary schools, colleges/universities, and physician offices in order to provide required and supplemental learning experiences for their students. More specifically, preceptors assess students' abilities to meet the

curricular content standards. Per accreditation standards for athletic training education, all preceptors must complete initial and ongoing preceptor training, a responsibility of the Clinical Education Coordinator (CEC) (CAATE 2020 Standards).

Currently, preceptors affiliated with the researcher's professional AT program receive training through online modules developed by the researcher and several colleagues. Each of the developers serve as athletic training program administrators, either as the Program Director or Clinical Education Coordinator (CEC).

The *Athletic Training Preceptor Course* is a Google website maintained by the developers. The course consists of an introduction and 3 modules: Evidence-Based Practice-An Introduction, Clinical Considerations for the Preceptor, and Incorporating Best Practices into Clinical Teaching. Module 1: Evidence-Based Practice module was developed by the researcher. Using the results of this dissertation as a guide, that module has now been expanded to provide more information on PROs, as well as contextual information on the ICF model and patient-centered care. The navigation menu in Figure 1 shows the arrangement of the module. A description of the content and changes made is included in the sections that follow.

Patient Values

A new page, titled "What About my Patient's Values?", has been added to highlight the importance of patient values as a component of EBP. The page was strategically placed just after the "Foundations of EBP" page where participants have just learned that patient values are one of three components of EBP. Several reflection questions are included to foreshadow upcoming content. This introductory page is followed by two new sub-pages.

ICF Model

The ICF model of disablement is the first sub-page and is presented as the framework for AT clinical practice. The content on the page is drawn from an NATA blog written by Beth

Sitzler (March 17, 2016). A color-coded image of the ICF model is provided along with an explanation of its components and how the model addresses patient values. In the next paragraph, participants are referred back to the blog via a link where a case is presented to help ATs understand the application of the ICF components. The final paragraph serves to wrap up the ICF discussion and emphasize its use in guiding clinical practice.

Patient-Centered Care

The second sub-page presents the concept of patient-centered care (PCC) as defined by the National Academy of Medicine. A visual graphic, created by the researcher, is included to facilitate an understanding of how patient values, the ICF model, and PCC are connected. Participants are then presented with three questions for self-reflection centered around their inclusion of patient values and the types of evidence used for clinical decision-making. The concluding comments on this sub-page preview the use of PROs to determine patient values.

Figure 1

Preceptor Course Navigation Menu

Becoming Familiar with Patient-Rated Outcome Measures

This page existed in the module's original content but has been modified with updated information and some information has been shifted to new sub-pages. The content on PROs has been expanded to provide new and continuing preceptors with contextual information on the relevance of PROs as well as peer AT perspectives on PRO use. On the main page, the most commonly used PROs reported in the study are highlighted following an overview of PROs. The Numeric Pain Rating Scale (NPRS) is included as a single-item measure, along with the Patient-Specific Functional Scale (PSFS) and the Lower Extremity Functional Scale (LEFS). An image and description for each instrument is provided along with a link to access more information. These instruments are good for ATs just beginning to use PROs as they are easy to implement,

interpret and score. They could also be used for patients with varying injuries. This would allow ATs to become confident with a few instruments before expanding to other instruments.

PRO Perspectives from Other ATs

The first sub-page is titled "PRO Perspectives from Other ATs". This new page contains three groupings of quotations from ATs in the study. Responses to open-ended survey items and interview questions are included. The first grouping is from the open-ended survey item asking how PRO use has changed in the last five years. The second grouping is from the interview question asking how patient-rated evidence and clinician-rated evidence is combined. The final grouping is from the interview question asking how PRO use impacts clinical decision-making and patient outcomes.

PRO Scoring

This new sub-page was created using some content from the original module which was then expanded to provide a deeper understanding of PRO scoring. ATs in the study cited both interpretation and access as challenges to PRO implementation. The content on the scoring page provides an overview of scoring and defines Minimal Clinically Important Difference (MCID) as a concept important for PRO implementation. This knowledge will help ATs know how to interpret changes in scores for the NRPS, the PSFS, and the LEFS. Sample scores for each of the PROs introduced on the main page are provided to assist ATs in interpreting meaningful changes in scores. The MCID explanation and sample scores content have been added to address PRO implementation challenges identified by ATs in the study. The final content on this page, which was moved from the main PRO page, directs participants to an attached peer-reviewed article intended to supplement PRO scoring and interpretation.

PRO Sources and Administration

Much of the content on this page related to PRO sources was moved over from the original main PRO page. Two additional sources have been added to provide participants with additional access to PROs. Each of these sources are web-based and provide detailed information about a variety of PROs. Similar to the PRO scoring content, the intent for adding this content is to assist ATs with overcoming challenges identified by peer ATs in the study. Using findings related to PRO use from the study, the content on PRO administration was added to assist ATs with PRO administration decisions. Specific content includes modes of PRO administration, point of care, and how these logistical decisions might impact clinical decisions for progression and return to activity.

The target audience for this research is practicing athletic trainers, including those serving as preceptors, as well as other health care professionals, regardless of clinical setting. Since ATs from different settings participated in the study, the findings may be applicable to other ATs in those settings. Just as many athletic trainers have learned skills and philosophies from other clinicians throughout their formative and continuing professional education, the same approach may be beneficial with regards to increasing PRO implementation. Theoretical plans for PRO implementation merely show the potential value PROs can provide. In contrast, the shared experiences and perceptions of colleagues who use PROs in clinical practice can provide a real-life experience.

CHAPTER III

ACTION PLAN

Ideally, my research findings would help ATs to see the role PROs play, both in providing the patient's perspective and also in evaluating the outcomes of interventions with patients. In particular, the first hand perspective of ATs who implement PROs in practice might truly demonstrate the value of PROs. In turn, seeing their value may increase usage with an end-result of improved outcomes for patients.

Another step in moving findings into action is to present them via poster and/or oral presentation at a state, district, or national meeting. One opportunity to present these findings was via recorded video presentation at the Mid-Atlantic Athletic Trainers' Association (MAATA) 2020 symposium. The MAATA symposium provided an ideal platform to share this information with ATs from every practice setting. Nationally, the NATA is divided into 10 districts across the country and the MAATA makes up NATA District 3, which includes North Carolina, South Carolina, Virginia, West Virginia, Maryland, and the District of Columbia.

The development of a continuing education course on PROs might be one of the most impactful strategies to increase PRO knowledge with resulting increases in use among ATs. All BOC credentialed ATs must complete continuing education on a two-year cycle with a proportion of the completed hours documented as EBP hours. With the potential to appeal ATs of all levels of experience and practice settings, the course will be designed to qualify for EBP credit through the NATA. Using the content from the online Preceptor Training modules, the goal of the 2-3 hour course will be to assist ATs with understanding how they might implement PROs in their

own practice. The researcher will seek opportunities to partner with the NATA and other groups that offer continuing education for ATs in the development and delivery of the course.

There are numerous relevant journals for which the researcher will seek publication of the study's results. The *Journal of Athletic Training (JAT)* is the peer-reviewed journal of the National Athletic Trainers' Association. Publishing the study's findings in the *JAT* would be a direct way to reach practicing athletic trainers in all clinical settings. The manuscript guidelines for *JAT* submission require clinical application to be addressed and this study's findings could provide many recommendations for implementation. Additionally, the *Athletic Training Education Journal*, focused on educational issues in athletic training, would be an appropriate distribution mechanism to highlight this gap in professional education along with the need to improve preceptor competence with PRO use. Seeing PRO implementation in the clinical setting might facilitate transfer of knowledge for students and allow them to have increased confidence with PROs. The *Journal of Sport Rehabilitation's (JSR)* mission aligns well with this study's focus as it aims to advance all aspects of sport rehabilitation for all members of the medical team. The researcher will consider preparing a manuscript for submission to the *JSR* but will seek publication in the *JAT* initially.

Long-term, I would like to work with other AT researchers and PRO advocates to increase PRO use. This could involve co-presenting, conducting research, and even the development of strategies geared toward increasing PRO use in athletic training. In particular, I would like to be involved with educating both students and clinicians on PRO use and the role PROs can play in patient-centered care. This could include workshops, web-based tutorials, and other mechanisms to facilitate increased PRO understanding and implementation in athletic training.

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APPENDIX A

PROS IN ATHLETIC TRAINING SURVEY

Survey Flow

Standard: Introduction-IC (4 Questions)
Block: Demographics (7 Questions)
Standard: PRO implementation (22 Questions)
Standard: Influencing Factors (3 Questions)

Page Break

Start of Block: Introduction-IC

This survey is part of a research study investigating how athletic trainers implement patient-rated outcome measures (PROs or PROMs) in clinical practice. I hope the results of this study can assist with establishing best practices for PRO use in athletic training. Participation in the study is voluntary and participants may choose to discontinue participation at any time. Please direct questions about the study to the Principal Investigator, Beverly Justice at brjustic@uncg.edu.

More information about the study is provided in this link: Justice irb information sheet. Do you agree to participate in this research project? Please click Yes to continue the survey. Click No to exit the survey.

- ○ Yes, I agree (1)
- ○ No, I disagree (2)

Skip To: End of Survey If Informed Consent = No, I disagree

What does the term **patient-rated outcome measure** mean to you? Please provide your "definition" in the space below.

_____

_____

_____

Thank you for providing your definition of a patient-rated outcome measure (PRO/PROM). That information will help me determine if the term means different things to different athletic trainers.

For the purpose of this study, a PRO will be defined as **any measure of a patient's health that comes directly from the patient**. The numeric pain rating scale, SF-12, FADI, KOOS, and the DASH are some of the most commonly used PROs. Collectively, PROs provide patient-oriented evidence. In contrast, clinician-rated evidence could be any of the measurements athletic trainers use when conducting physical examinations: range of motion, muscular strength, and goniometric measurements. In other words, these measurements provide important information for the clinician but not from the patient's perspective.

The remaining questions will help me understand how athletic trainers use PROs in clinical practice and the factors that facilitate their use. Please answer all questions openly and honestly.

End of Block: Introduction-IC

Start of Block: Demographics

*

What is your age?

_____

What is your sex?

- ○ Male (1)
- ○ Female (2)
- ○ Other (3) _____

What is your race/ethnicity? Choose all that apply.

- ☐ White (1)
- ☐ Black or African American (2)
- ☐ American Indian or Alaska Native (3)
- ☐ Asian (4)
- ☐ Native Hawaiian or Pacific Islander (5)
- ☐ Hispanic or Latino (6)
- ☐ Other (7) _____

How many years of clinical experience do you have as a BOC credentialed athletic trainer?

- ○ <3 years (1)
- ○ 3-5 years (2)
- ○ 6-10 years (3)
- ○ 11-20 years (4)
- ○ 20 or more years (5)

In what NATA district do you currently practice?

- ○ 1 Eastern Athletic Trainers' Association (D1) (1)
- ○ 2 Eastern Athletic Trainers' Association (D2) (2)
- ○ 3 Mid-Atlantic Athletic Trainers' Association (3)
- ○ 4 Great Lakes Athletic Trainers' Association (4)
- ○ 5 Mid America Athletic Trainers' Association (5)
- ○ 6 Southwest Athletic Trainers' Association (6)
- ○ 7 Rocky Mountain Athletic Trainers' Association (7)
- ○ 8 Far West Athletic Trainers' Association (8)
- ○ 9 Southeast Athletic Trainers' Association (9)
- ○ 10 Northwest Athletic Trainers' Association (10)

In what setting do you currently practice patient care?

- ○ Secondary school (1)
- ○ College/university (2)
- ○ Professional sports (3)
- ○ Hospital/clinic (4)
- ○ Emerging Setting (occupational health, military, public safety, performing arts, physician practice) (5)
- ○ Other (7) _____
- ○ I am not currently practicing patient care (6)

What patient populations do you serve as an athletic trainer in your current job setting? Check all that apply.

- ☐ Adolescents (1)
- ☐ Adults 18-64 (2)
- ☐ Adults over age 65 (3)
- ☐ Athletic/physically active (4)
- ☐ Non-athletic/non-physically active (5)

End of Block: Demographics

Start of Block: PRO implementation

How often do you use patient-rated outcome measures (PROs/PROMs) in clinical practice?

- ○ Never (40)
- ○ Sometimes (41)
- ○ About half the time (42)
- ○ Most of the time (43)
- ○ Always (44)

By which method do you administer patient-rated outcome measures (PROs/PROMs) to your patients? Choose all that apply.

- ☐ Electronically (1)
- ☐ Pen and paper (2)
- ☐ Verbally (3)

With what types of medical cases do you implement patient-rated outcome measures (PROs/PROMs)?

- ○ Only non-surgical (1)
- ○ Only surgical (2)
- ○ Both surgical and non-surgical (3)

Indicate how important each of these selection criteria is to you when choosing patient-rated outcome measures (PROs/PROMs).

	Not at all important (11)	Slightly important (12)	Moderately important (13)	Very important (14)	Extremely important (15)
Easy for patients to understand (1)	○	○	○	○	○
Most appropriate for active patients (2)	○	○	○	○	○
Shown to be valid and reliable (3)	○	○	○	○	○
Easy for clinicians to understand/interpret meaning of scores and change in scores (4)	○	○	○	○	○
Most appropriate for the types of conditions seen in my practice setting (5)	○	○	○	○	○
Useful for a variety of purposes (eg, research, quality assurance, patient evaluation (6)	○	○	○	○	○
Can be completed quickly (7)	○	○	○	○	○
Can be analyzed electronically (8)	○	○	○	○	○

Why do you use patient-rated outcome measures (PROs/PROMs) in clinical practice? If you have multiple reasons, perhaps list the top 3 reasons.

_____

_____

_____

At what points during patient care do you administer patient-rated outcome measures (PROs/PROMs)? Check all that apply.

- ☐ At the time of initial evaluation (1)
- ☐ At intervals throughout the patient's care (2)
- ☐ At the time of discharge (3)
- ☐ Other (4) _____

Page Break

For the purpose of this study, a patient-rated outcome measure (PRO/PROM) will be defined as **any measure of a patient's health that comes directly from the patient**.

Indicate which of the following specific measure(s) you use for the **foot and ankle**. Choose all that apply.

- [ ] N/A. I do not work with the foot and ankle (10)
- [ ] None. I do not use specific measures for the foot and ankle (9)
- [ ] Foot and Ankle Ability Measure (FAAM) (1)
- [ ] Foot and Ankle Disability Index (FADI) (2)
- [ ] AAOS Foot and Ankle Core Score (3)

☐ Lower Extremity Functional Scale (LEFS) (4)

☐ Sports Ankle Rating Quality of Life Measure (5)

☐ Foot Function Index (6)

☐ Foot Health Status Questionnaire (7)

☐ Other (8) _____

Indicate which of the following specific measures you use for the **knee**. Choose all that apply.

- [ ] N/A. I do not work with the knee (13)
- [ ] None. I do not use specific measures for the knee (12)
- [ ] Lower Extremity Functional Scale (LEFS) (1)
- [ ] Knee Osteoarthritis Outcome Score (KOOS) (2)
- [ ] International Knee Documentation Committee (IKDC) (3)
- [ ] Cincinnati Knee Scale (4)
- [ ] Lysholm Knee Functioning Scoring Scale (5)
- [ ] Tegner Activity Level Rating Scale (6)
- [ ] Western Ontario and McMaster Universities Osteoarthritis Index (7)
- [ ] Jujala Patellofemoral Score/Anterior Knee Pain Score (8)
- [ ] Western Ontario Meniscal Evaluation Tool (9)
- [ ] Oxford Knee Score (10)
- [ ] Other (11) _____

Indicate which of the following specific measures you use for the **hip**. Choose all that apply.

- [ ] N/A. I do not work with the hip (10)
- [ ] None. I do not use specific measures for the hip (9)
- [ ] Lower Extremity Functional Scale (LEFS) (1)
- [ ] Hip Disability and Osteoarthritis Outcome Score (2)
- [ ] Hip Outcome Score (3)
- [ ] AAOS Hip and Knee Score (4)
- [ ] Harris Hip Score (5)
- [ ] Western Ontario and McMaster Universities Osteoarthritis Index (6)
- [ ] Nonarthritic Hip Score (7)
- [ ] Other (8) _____

Indicate which of the following specific measures you use for the **back**. Choose all that apply.

- [ ] N/A. I do not work with the back (9)
- [ ] None. I do not use specific measures for the back (8)
- [ ] Oswestry or Modified Oswestry Disability Index (1)
- [ ] Low Back Outcome Score (2)
- [ ] Roland Morris Disability Questionnaire (3)
- [ ] Waddell Disability Index (4)
- [ ] North American Spine Society Lumbar Spine Assessment Instrument (5)
- [ ] Quebec Back Pain and Disability Scale (6)
- [ ] Other (7) _____

Indicate which of the following specific measures you use for the **shoulder and elbow**. Choose all that apply.

- [ ] N/A. I do not work with the shoulder and elbow (20)
- [ ] None. I do not use specific measures for the shoulder and elbow (19)
- [ ] Disabilities of the Arm Shoulder and Hand (DASH) (1)
- [ ] Quick DASH (2)
- [ ] Upper Extremity Functional Scale (3)
- [ ] Functional Arm Scale for Throwers (4)
- [ ] Shoulder Pain and Disability Index (5)
- [ ] Kerlan-Jobe Orthopaedic Questionnaire (6)
- [ ] American Shoulder and Elbow Surgeons Self-Report Form (7)
- [ ] Pennsylvania Shoulder Score (8)
- [ ] Shoulder Rating Questionnaire (9)
- [ ] Shoulder Disability Questionnaire (10)
- [ ] Simple Shoulder Test (11)
- [ ] Western Ontario Shoulder Instability Index (12)
- [ ] Flexilevel Scale for Shoulder Function (13)
- [ ] Oxford Shoulder Score (14)

☐ Upper Limb Functional Limitation Scale (15)

☐ Constant Murley Shoulder Score (16)

UCLA Shoulder Rating Score (17)

☐ Other (18) _____

Indicate which of the following specific measures you use for the **wrist and hand**. Choose all that apply.

☐ N/A. I do not work with the wrist and hand (10)

☐ None. I do not use specific measures for the wrist and hand (9)

☐ Disability of the Arm Shoulder and Hand (DASH) (1)

☐ Quick DASH (2)

☐ Upper Extremity Functional Scale (3)

☐ Michigan Hand Outcomes Questionnaire (4)

☐ Patient-Rated Wrist Evaluation Questionnaire (5)

☐ Brigham and Women's Carpal Tunnel Questionnaire (6)

☐ Garland and Werley Score (7)

☐ Other (8) _____

Indicate which of the following specific measures you use for the **neck**. Choose all that apply.

- [ ] N/A. I do not work with the neck (6)
- [ ] None. I do not use specific measures for the neck (5)
- [ ] Neck Disability Index (1)
- [ ] Copenhagen Neck Functional Disability Scale (2)
- [ ] Northwick Park Therapy Dependency Assessment (3)
- [ ] Other (4) _____

Page Break

For the purpose of this study, a PRO will be defined as **any measure of a patient's health that comes directly from the patient**.

Generic measures are global in nature and address several domains of health. Indicate which of the following **generic measures** you use in clinical practice. Choose all that apply.

- ☐ Short Form-12 or Short Form-36 (1)
- ☐ Disablement in the Physically Active Scale (DPA) (2)
- ☐ Short Musculoskeletal Functional Assessment (3)
- ☐ Pediatric Quality of Life Inventory (4)
- ☐ Musculoskeletal Functional Assessment (5)
- ☐ Pediatric Outcomes Data Collection Instrument (6)
- ☐ Sickness Impact Profile (7)
- ☐ Other (8) _____

Single-item measures include only one question (with the exception of the Patient-Specific Functional Scale). Indicate which of the following **single-item measures** you use in clinical practice. Choose all that apply.

- ☐ Numeric Pain Rating Scale (1)
- ☐ Global Rating of Change Scale (2)
- ☐ Patient-Specific Functional Scale (3)
- ☐ Global Rating of Function (4)
- ☐ Patient Rating of Satisfaction With Care (5)
- ☐ Global Rating of Disability (6)
- ☐ Single-Item Numeric Evaluation (SANE) (7)
- ☐ Patient Rating of Satisfaction With Injured Body Part (8)
- ☐ Patient Acceptable Symptom State (PASS) (9)
- ☐ Other (10) _____

Indicate what percentage of time you use these types of outcomes by typing a number in the box provided for each.

_____ Clinician-based outcomes (i.e. girth measurements, muscular strength) (1)
_____ Patient-rated outcomes (i.e. specific, general, and/or single-item measures) (2)

In the last 5 years, has the percentage of time you use patient-rated outcomes changed?

- ○ Yes (1)
- ○ No (2)

Display This Question:

If In the last 5 years, has the percentage of time you use patient-rated outcomes changed? = Yes

Please explain how your use of patient-rated outcomes has changed in the last 5 years.

_____

_____

_____

What challenges have you encountered when implementing patient-rated outcome measures (PROs/PROMs) in clinical practice?

_____

_____

_____

Please explain how you combine clinician-based outcomes with patient-rated outcomes in clinical practice.

_____

_____

_____

End of Block: PRO implementation

Start of Block: Influencing Factors

Indicate how much each of these sources have contributed to your implementation of patient-rated outcome measures (PROs/PROMs) in clinical practice.

	None at all (36)	A little (37)	A moderate amount (38)	A lot (39)	A great deal (40)
Entry-level athletic training program (1)	○	○	○	○	○
Post-professional athletic training program (2)	○	○	○	○	○
Continuing education sessions (3)	○	○	○	○	○
Peer-reviewed literature (4)	○	○	○	○	○
Other sources (eg, web-based information, books) (5)	○	○	○	○	○
Another athletic trainer (6)	○	○	○	○	○
Other health care professionals (7)	○	○	○	○	○

How important is each of these factors in influencing your decision to use patient-rated outcome measures (PROs/PROMs) in clinical practice?

	Not at all important (11)	Slightly important (12)	Moderately important (13)	Very important (14)	Extremely important (15)
Improves my patient outcomes (1)	○	○	○	○	○
Assists with seeking patient perspective (2)	○	○	○	○	○
Required by my employer (3)	○	○	○	○	○
Improves my clinical decision-making (4)	○	○	○	○	○
Improves communication with other health care providers (5)	○	○	○	○	○
Other (6)	○	○	○	○	○

Please provide any additional information about your experiences with using patient-rated outcome measures (PROs/PROMs) in clinical practice.

_____

_____

_____

_____

_____

End of Block: Influencing Factors

APPENDIX B

INDIVIDUAL INTERVIEW GUIDE

1) Can you describe your position as an AT and the patient population you work with? (Icebreaker question)
2) I am going to share my screen and you'll see a diagram of the ICF Model of Disablement. The second row of the diagram addresses a patient's functioning and disability associated with their injury/condition. Can you describe how you measure or evaluate each of these? Let's start with body structure and function or impairments.
    a. Activity (limitations)?
    b. Participation (restrictions)?
3) The last row of the diagram addresses the contextual factors that may also affect or influence a patient's injury/condition. Can you describe how you measure or evaluate each of these? Let's take environmental factors first.
    a. Personal factors?
4) What does the term patient-rated outcome measure mean to you?
5) Generally speaking, how do you incorporate patient-rated outcome measures into your clinical practice?
6) Can you explain your procedure for administering patient-rated outcome measures?
7) What information do you feel patient-rated outcome measures provide that can't be obtained with clinician-rated evidence?
8) How do you incorporate the information you get from the patient-rated outcome measures with your clinical evidence?
9) How do you feel the use of patient-rated outcome measures impacts your clinical decision-making?
10) How do you feel your patient outcomes are impacted by your use of patient-rated outcome measures?
11) Can you describe challenges you've encountered with implementing patient-rated outcome measures and how you've addressed these challenges?
12) What factors most contribute to your use of patient-rated outcome measures?

APPENDIX C

RECRUITMENT EMAIL TO PROGRAM DIRECTORS

Dear Program Director,

I hope this message finds you well and enjoying the academic year. I am an athletic training educator and a doctoral candidate in the EdD program in Kinesiology at the University of North Carolina at Greensboro. As such, I am in the midst of collecting data for my dissertation.

My goal for study participant recruitment is to target those ATs who are implementing PROs in clinical practice and this is where your students/residents can help. If you're willing, **please share the message and survey link below with those ATs in your program**. The results of this study will help me learn more about how PROs are being implemented in athletic training, how PRO use impacts clinical decision-making, and influential factors in PRO use. Ultimately, I am hopeful the results of this study can contribute to developing best practices or PRO use in athletic training.

If interested, I will be happy to share my study results and invite any questions you may have.

Respectfully,
Beverly Justice, MA, LAT, ATC

APPENDIX D

PARTICIPANT SCRIPT

Dear Fellow Athletic Trainer,

My name is Beverly Justice, and I am a doctoral candidate in the School of Health and Human Sciences (Department of Kinesiology) at the University of North Carolina at Greensboro. I am conducting a research study examining how patient-rated outcome measures are used in athletic training and you are invited to participate in the study. If you agree, you are invited to participate in a survey and focus group/individual interview or survey only.

It is anticipated the survey will take no more than 10 minutes to complete and the focus group or individual interview is anticipated to take no more than 30 minutes. If you opt to participate in the focus group/individual interview, it will be audio recorded for transcription purposes.

Participation in this study is voluntary. Your identity as a survey participant will remain confidential during and after the study. If you choose to participate in a focus group/individual interview, I will ask for your contact information at the conclusion of the survey. Your confidentiality will be maintained with the use of pseudonyms and no information will be included in the study's findings that could identify you.

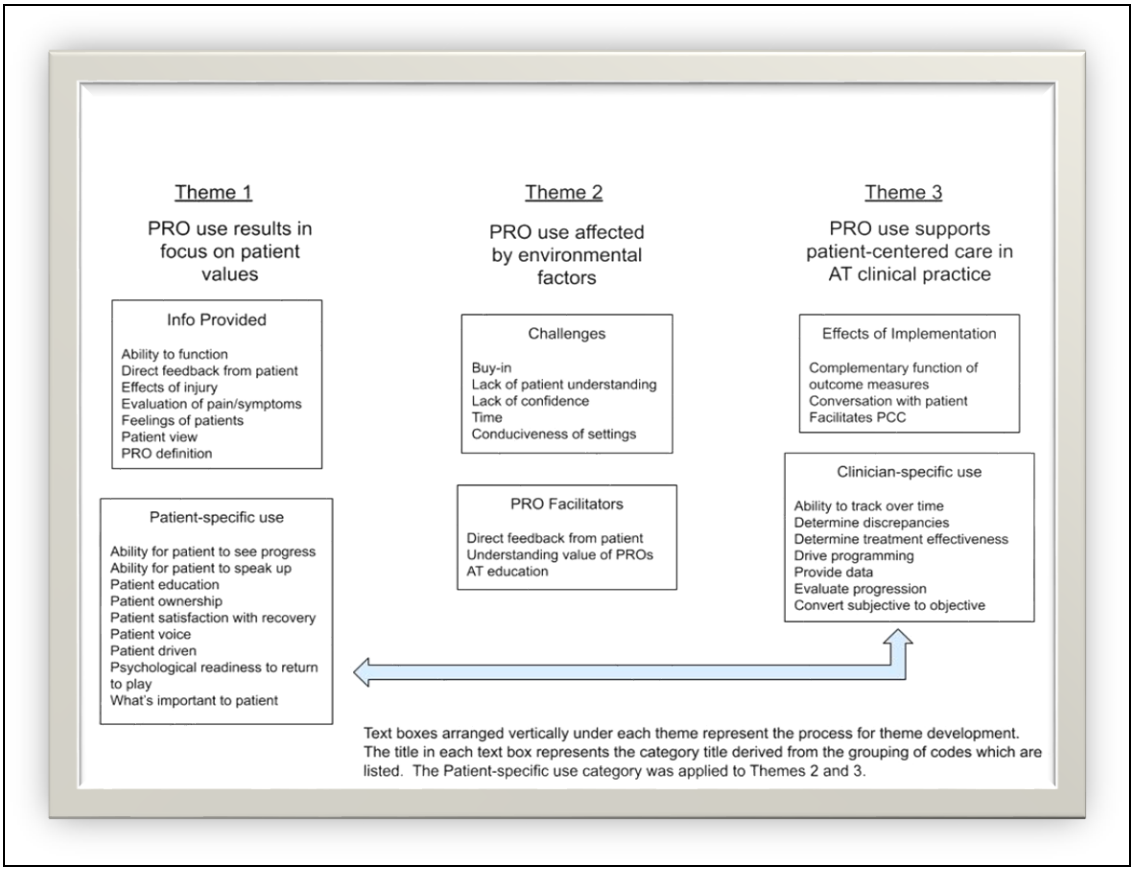
If you have questions or concerns, please contact me at brjustic@uncg.edu or my faculty advisor, Dr. Diane Gill at dlgill@uncg.edu.

Thank you for your participation,

Beverly R. Justice, MA, LAT
University of North Carolina at Greensboro
Department of Kinesiology
Doctoral Candidate

APPENDIX E

QUALITATIVE ANALYSIS FOR AIMS 2 AND 3



APPENDIX F

SURVEY RESULTS TABLES

*Frequencies for Specific PRO Instruments by Body Region**		
Foot/Ankle Instruments	Frequency (n=50)	Percentage
Lower Extremity Functional Scale (LEFS)	21	42%
Foot and Ankle Ability Measure (FAAM)	16	32%
Foot and Ankle Disability Index (FADI)	14	28%
Reported non-use for foot/ankle instruments	18	36%
Knee Instruments	Frequency (n=53)	Percentage
Lower Extremity Functional Scale (LEFS)	27	51%
Knee Osteoarthritis Outcome Score (KOOS)	14	26%
International Knee Documentation Committee (IKDC)	10	19%
Reported non-use for knee instruments	17	32%
Hip Instruments	Frequency (n=51)	Percentage
Lower Extremity Functional Scale (LEFS)	19	37%
Hip Disability and Osteoarthritis Outcome Score	7	14%
Hip Outcome Score	6	12%
Reported non-use for hip instruments	23	45%
Back Instruments	Frequency (n=52)	Percentage
Oswestry or Modified Oswestry Disability Index	19	37%
Quebec Back Pain and Disability Scale	4	8%
Low Back Outcome Score	3	6%
Reported non-use for back instruments	24	47%
Shoulder/Elbow Instruments	Frequency (n=52)	Percentage
Disabilities of the Arm Shoulder and Hand (DASH)	25	48%
Quick DASH	25	48%
Upper Extremity Functional Scale	11	21%
Reported non-use for shoulder/elbow instruments	15	29%
Wrist/Hand Instruments	Frequency (n=53)	Percentage
Disabilities of the Arm Shoulder and Hand (DASH)	16	30%
Quick DASH	20	38%
Upper Extremity Functional Scale	11	21%
Reported non-use for wrist/hand instruments	25	47%
Neck Instruments	Frequency (n=53)	Percentage
Neck Disability Index	14	26%
Copenhagen Neck Functional Disability Scale	1	2%
Reported non-use for neck instruments	32	60%

**Only 3 highest frequencies reported for each body region*

*Frequencies for Generic and Single Item PRO Instruments**		
Generic Instruments	Frequency (n=31)	Percentage
Short Form-12 or Short Form-36	15	48%
Disablement in the Physically Active Scale (DPA)	8	26%
Musculoskeletal Functional Assessment	9	29%
Short Musculoskeletal Functional Assessment	8	26%
Pediatric Quality of Life Inventory	5	16%
Single-Item Instruments	Frequency (n=49)	Percentage
Numeric Pain Rating Scale	44	90%
Global Rating of Change Scale (GROC)	16	33%
Patient-Specific Functional Scale (PSFS)	11	22%
Patient Rating of Satisfaction With Care	6	12%
Single-Item Numeric Evaluation (SANE)	5	10%
Patient Rating of Satisfaction with Injured Body Part	5	10%

**Only 5 highest frequencies reported for each category*

Importance of Selection Criteria for PROs						
Criteria	Mean ± SD	Extremely Important	Very Important	Moderately Important	Slightly Important	Not at All Important
Easy for patients to understand	4.45±.65	31(53.4%)	22(37.9%)	5(8.6%)	0(0%)	0(0%)
Most appropriate for active patients	3.86±.87	15(25.9%)	23(39.6%)	17(29.3%)	3(5.2%)	0(0%)
Shown to be valid and reliable	4.10±.74	18(31.0%)	29(50.0%)	10(17.2%)	1(1.7%)	0(0%)
Easy for clinicians to understand/interpret meaning of scores and change in scores	4.14±.83	20(34.5%)	29(50.0%)	7(12.1%)	1(1.7%)	1(1.7%)
Most appropriate for the types of conditions seen in my practice setting	4.07±.79	17(29.3%)	31(53.4%)	7(12.1%)	3(5.2%)	0(0%)
Useful for a variety of purposes (eg, research, quality assurance, patient evaluation)	3.28±1.0	7(12.1%)	16(27.6%)	24(41.4%)	8(13.8%)	3(5.2%)
Can be completed quickly	4.22±.94	29(50%)	16(27.6%)	11(19.0%)	1(1.7%)	1(1.7%)
Can be analyzed electronically	3.28±1.2	9(15.5%)	20(34.5%)	14(24.1%)	8(13.8%)	7(12.1%)

N=58

Contributors to Implementation of PROs

Contributors	Mean ± SD	A Great Deal	A Lot	A Moderate Amount	A Little	None at All
Entry-level athletic training program	2.32±1.41	7(14.0%)	3(6.0%)	8(16.0%)	13(26.0%)	19(38.0%)
Post-professional athletic training program	3.56±1.28	15(30.0%)	12(24.0%)	14(28.0%)	4(8.0%)	5(10.0%)
Continuing education sessions	2.48±1.38	4(8.3%)	10(20.8%)	8(16.7%)	9(18.8%)	17(35.4%)
Peer-reviewed literature	3.16±.98	4(8.0%)	13(26.0%)	23(46.0%)	7(14.0%)	3(6.0%)
Other sources (e.g., web-based information, books)	2.44±1.13	2(4.0%)	7(14.0%)	14(28.0%)	15(30.0%)	12(24.0%)
Another athletic trainer	3.14±1.20	5(10.0%)	17(34.0%)	15(30.0%)	6(12.0%)	7(14.0%)
Other health care professionals	2.73±1.35	4(8.3%)	13(27.1%)	10(20.8%)	8(16.7%)	13(27.1%)

N= 50 except for Continuing education sessions and Other health care professionals N = 48

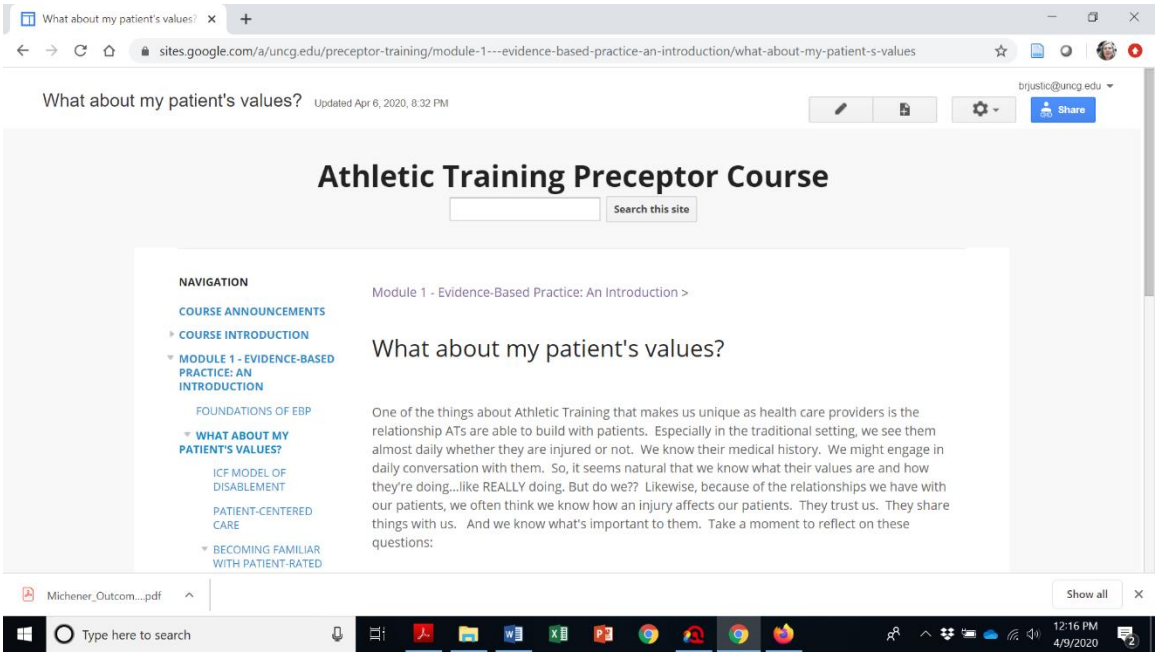
Influential Factors for Implementation of PROs

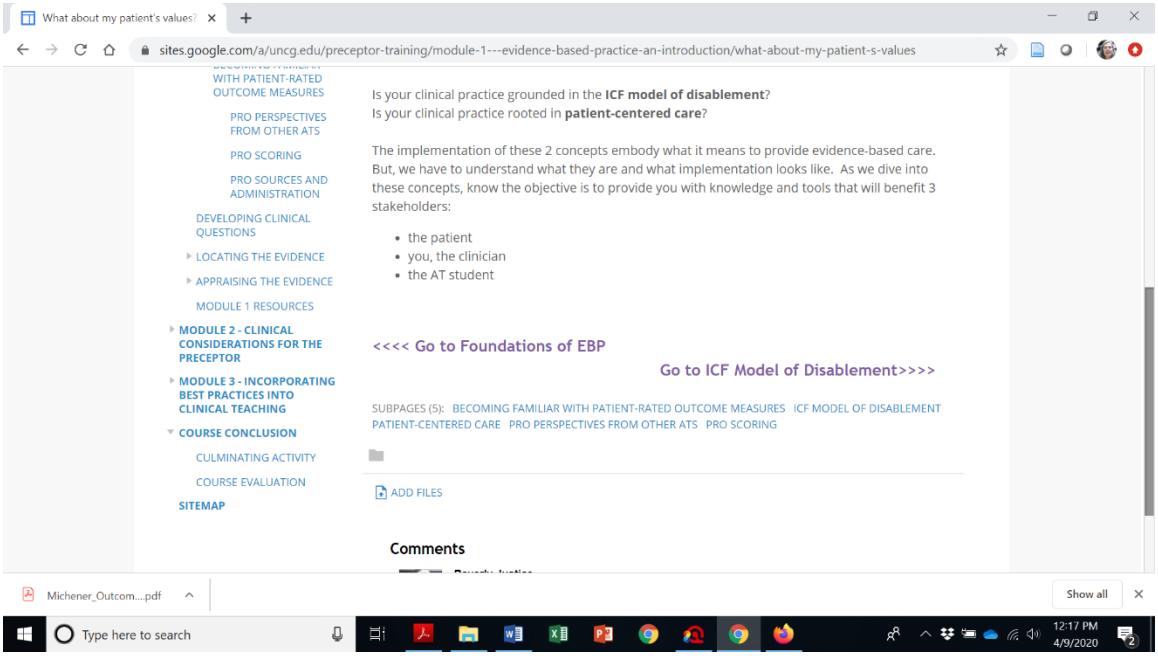
Factors	Mean ± SD	Extremely Important	Very Important	Moderately Important	Slightly Important	None at All Important
Improves patient outcomes	4.28±.76	22(44.0%)	21(42.0%)	6(12.0%)	1(2.0%)	0(0%)
Assists with seeking patient perspective	4.34±.69	23(46.0%)	21(42.0%)	6(12.0%)	0(0%)	0(0%)
Required by employer	2.16±1.32	3(6.0%)	6(12.0%)	11(22.0%)	6(12.0%)	24(48.0%)
Improves clinical decision-making	4.14±.90	20(40.0%)	20(40.0%)	8(16.0%)	1(2.0%)	1(2.0%)
Improves communication with other health care providers	3.54±1.13	10(20.0%)	19(38.0%)	12(24.0%)	6(12.0%)	3(6.0%)
Other	2.12±1.65	3(17.6%)	1(5.9%)	2(11.8%)	0(0%)	11(64.7%)

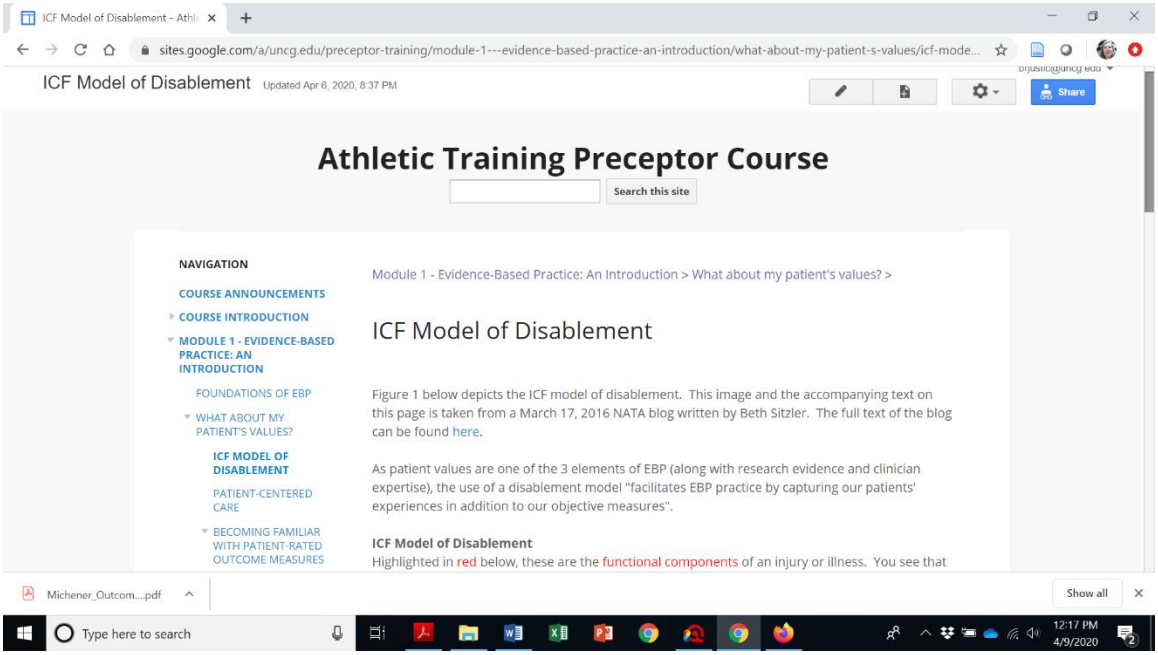
N = 50 except for Other N = 17

APPENDIX G

ATHLETIC TRAINING PRECEPTOR COURSE SCREENSHOTS






ICF Model of Disablement - Athl
sites.google.com/a/uncg.edu/preceptor-training/module-1---evidence-based-practice-an-introduction/what-about-my-patient-s-values/icf-mode...
ICF Model of Disablement
Updated Apr 6, 2020, 8:37 PM
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COURSE INTRODUCTION
MODULE 1 - EVIDENCE-BASED PRACTICE: AN INTRODUCTION
FOUNDATIONS OF EBP
WHAT ABOUT MY PATIENT'S VALUES?
ICF MODEL OF DISABLEMENT
PATIENT-CENTERED CARE
BECOMING FAMILIAR WITH PATIENT-RATED OUTCOME MEASURES
Module 1 - Evidence-Based Practice: An Introduction > What about my patient's values? >
ICF Model of Disablement
Figure 1 below depicts the ICF model of disablement. This image and the accompanying text on this page is taken from a March 17, 2016 NATA blog written by Beth Sitzler. The full text of the blog can be found here.
As patient values are one of the 3 elements of EBP (along with research evidence and clinician expertise), the use of a disablement model "facilitates EBP practice by capturing our patients' experiences in addition to our objective measures".
ICF Model of Disablement
Highlighted in red below, these are the functional components of an injury or illness. You see that
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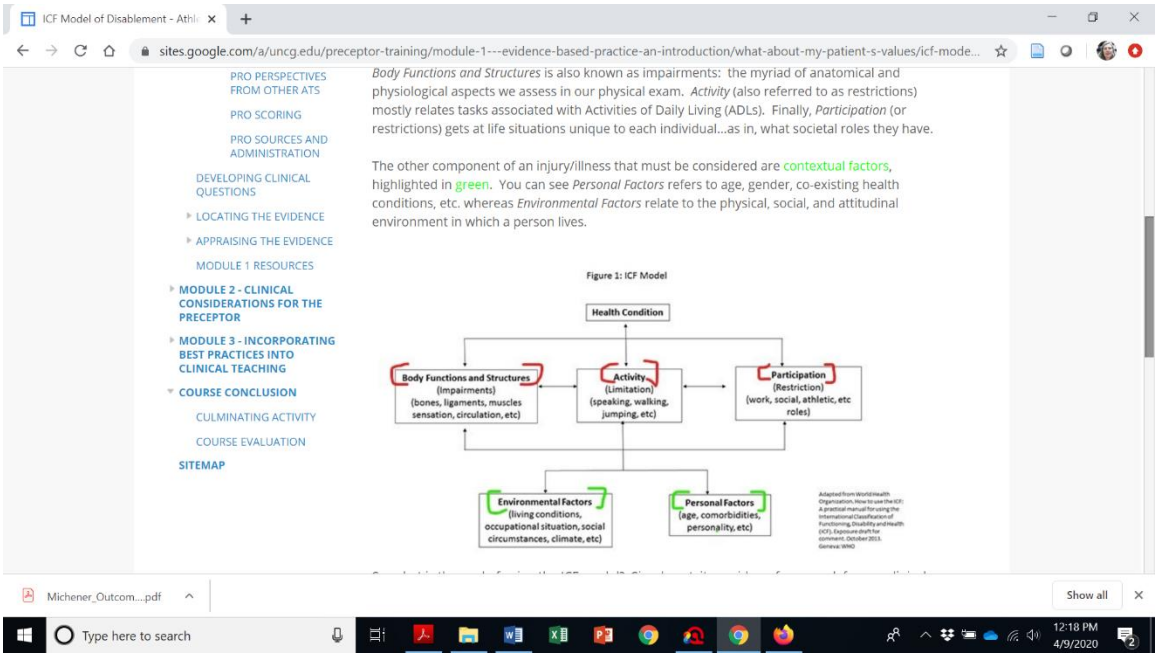
4/9/2020


ICF Model of Disablement - Athl
sites.google.com/a/uncg.edu/preceptor-training/module-1---evidence-based-practice-an-introduction/what-about-my-patient-s-values/icf-mode...
PRO PERSPECTIVES FROM OTHER ATS
PRO SCORING
PRO SOURCES AND ADMINISTRATION
DEVELOPING CLINICAL QUESTIONS
LOCATING THE EVIDENCE
APPRAISING THE EVIDENCE
MODULE 1 RESOURCES
MODULE 2 - CLINICAL CONSIDERATIONS FOR THE PRECEPTOR
MODULE 3 - INCORPORATING BEST PRACTICES INTO CLINICAL TEACHING
COURSE CONCLUSION
CULMINATING ACTIVITY
COURSE EVALUATION
SITEMAP
Body Functions and Structures and Activity are also known as impairments: the myriad of anatomical and physiological aspects we assess in our physical exam. Activity (also referred to as restrictions) mostly relates tasks associated with Activities of Daily Living (ADLs). Finally, Participation (or restrictions) gets at life situations unique to each individual...as in, what societal roles they have.
The other component of an injury/illness that must be considered are contextual factors, highlighted in green. You can see Personal Factors refers to age, gender, co-existing health conditions, etc. whereas Environmental Factors relate to the physical, social, and attitudinal environment in which a person lives.
Figure 1: ICF Model
Health Condition
Body Functions and Structures (Impairments) (bones, ligaments, muscles sensation, circulation, etc)
Activity (Limitation) (speaking, walking, jumping, etc)
Participation (Restriction) (work, social, athletic, etc roles)
Environmental Factors (living conditions, occupational situation, social circumstances, climate, etc)
Personal Factors (age, comorbidities, personality, etc)
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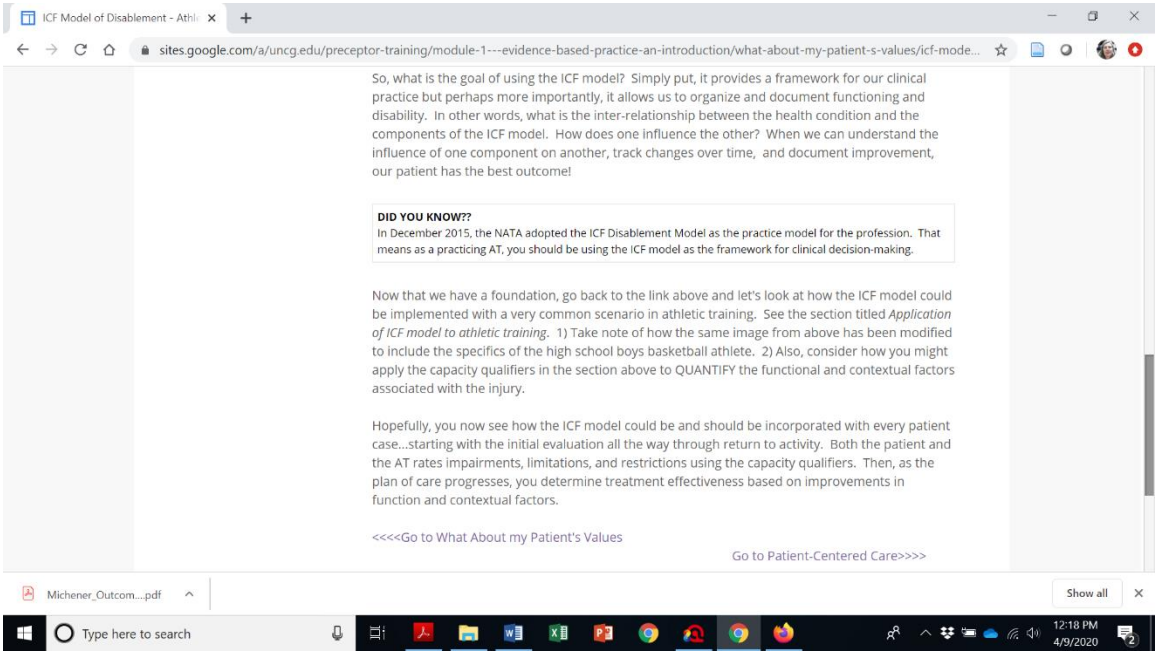
4/9/2020


ICF Model of Disablement - Athl
sites.google.com/a/uncg.edu/preceptor-training/module-1---evidence-based-practice-an-introduction/what-about-my-patient-s-values/icf-mode...
So, what is the goal of using the ICF model? Simply put, it provides a framework for our clinical practice but perhaps more importantly, it allows us to organize and document functioning and disability. In other words, what is the inter-relationship between the health condition and the components of the ICF model. How does one influence the other? When we can understand the influence of one component on another, track changes over time, and document improvement, our patient has the best outcome!
DID YOU KNOW??
In December 2015, the NATA adopted the ICF Disablement Model as the practice model for the profession. That means as a practicing AT, you should be using the ICF model as the framework for clinical decision-making.
Now that we have a foundation, go back to the link above and let's look at how the ICF model could be implemented with a very common scenario in athletic training. See the section titled Application of ICF model to athletic training. 1) Take note of how the same image from above has been modified to include the specifics of the high school boys basketball athlete. 2) Also, consider how you might apply the capacity qualifiers in the section above to QUANTIFY the functional and contextual factors associated with the injury.
Hopefully, you now see how the ICF model could be and should be incorporated with every patient case...starting with the initial evaluation all the way through return to activity. Both the patient and the AT rates impairments, limitations, and restrictions using the capacity qualifiers. Then, as the plan of care progresses, you determine treatment effectiveness based on improvements in function and contextual factors.
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Patient-Centered Care
Using the ICF Model of Disablement as the framework for clinical practice leads to patient-centered care or PCC. Similar to the ICF model, it also ensures patient values are considered. So, it is essentially another aspect of practicing EBP.
Check out this diagram to see how all of these concepts are interwoven.
1. Best Research
2. Clinician Expertise
3. Patient Values
Evidence-Based Practice
Improved Patient Care
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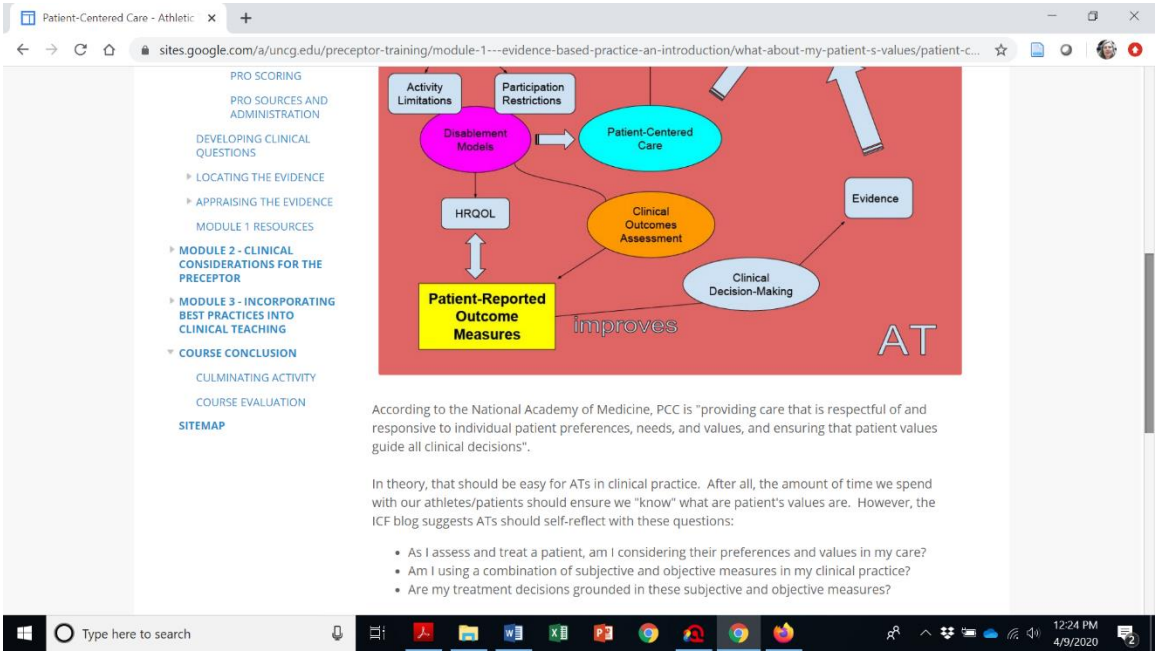
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HRQOL
Clinical Outcomes Assessment
Evidence
Clinical Decision-Making
Patient-Reported Outcome Measures
improves
AT
According to the National Academy of Medicine, PCC is "providing care that is respectful of and responsive to individual patient preferences, needs, and values, and ensuring that patient values guide all clinical decisions".
In theory, that should be easy for ATs in clinical practice. After all, the amount of time we spend with our athletes/patients should ensure we "know" what are patient's values are. However, the ICF blog suggests ATs should self-reflect with these questions:
As I assess and treat a patient, am I considering their preferences and values in my care?
Am I using a combination of subjective and objective measures in my clinical practice?
Are my treatment decisions grounded in these subjective and objective measures?
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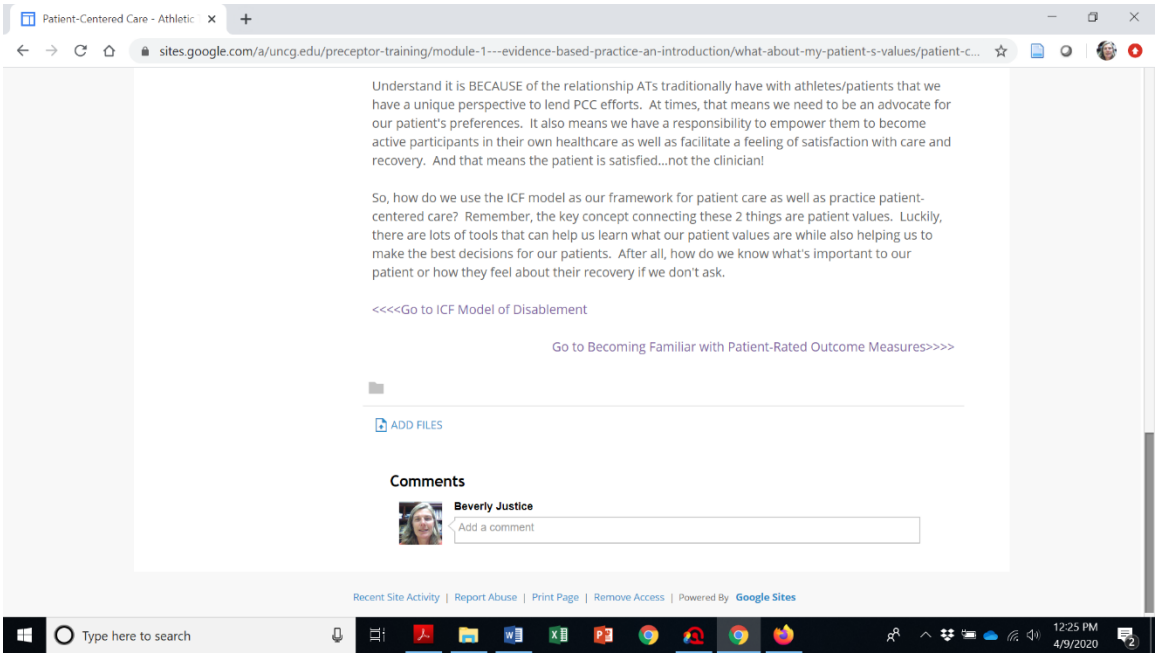
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Understand it is BECAUSE of the relationship ATs traditionally have with athletes/patients that we have a unique perspective to lend PCC efforts. At times, that means we need to be an advocate for our patient's preferences. It also means we have a responsibility to empower them to become active participants in their own healthcare as well as facilitate a feeling of satisfaction with care and recovery. And that means the patient is satisfied...not the clinician!
So, how do we use the ICF model as our framework for patient care as well as practice patient-centered care? Remember, the key concept connecting these 2 things are patient values. Luckily, there are lots of tools that can help us learn what our patient values are while also helping us to make the best decisions for our patients. After all, how do we know what's important to our patient or how they feel about their recovery if we don't ask.
<<<<Go to ICF Model of Disablement
Go to Becoming Familiar with Patient-Rated Outcome Measures>>>>
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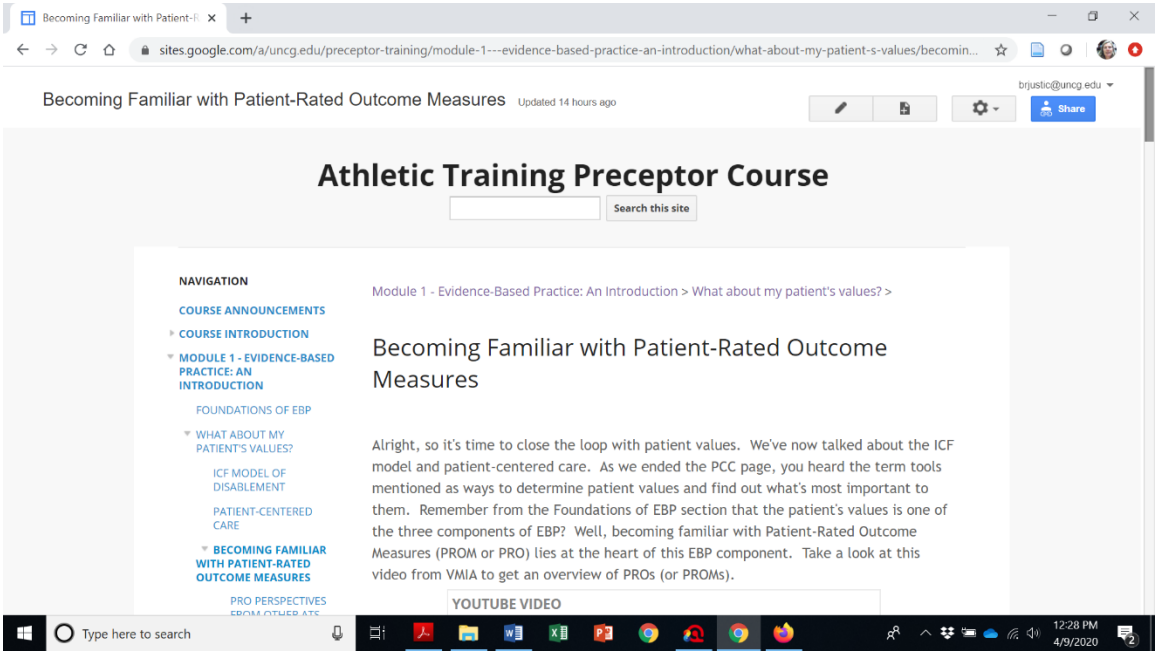
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Becoming Familiar with Patient-Rated Outcome Measures
Alright, so it's time to close the loop with patient values. We've now talked about the ICF model and patient-centered care. As we ended the PCC page, you heard the term tools mentioned as ways to determine patient values and find out what's most important to them. Remember from the Foundations of EBP section that the patient's values is one of the three components of EBP? Well, becoming familiar with Patient-Rated Outcome Measures (PROM or PRO) lies at the heart of this EBP component. Take a look at this video from VMIA to get an overview of PROs (or PROMs).
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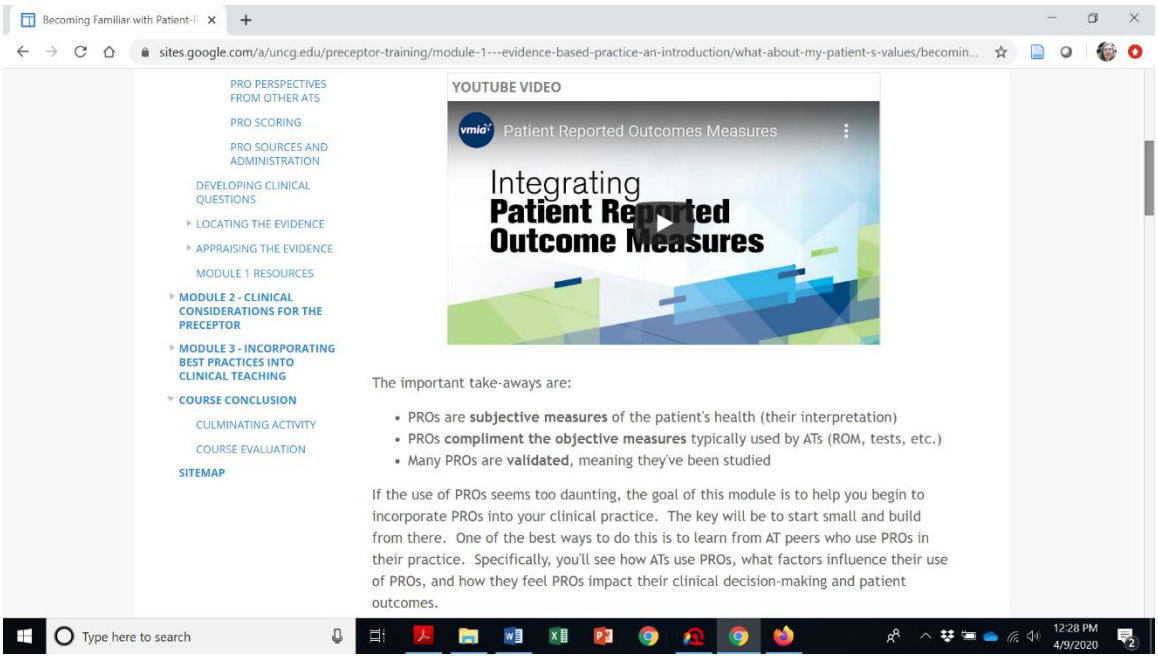
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YOUTUBE VIDEO
Patient Reported Outcomes Measures
Integrating
Patient Reported
Outcome Measures
The important take-aways are:
PROs are subjective measures of the patient's health (their interpretation)
PROs compliment the objective measures typically used by ATs (ROM, tests, etc.)
Many PROs are validated, meaning they've been studied
If the use of PROs seems too daunting, the goal of this module is to help you begin to incorporate PROs into your clinical practice. The key will be to start small and build from there. One of the best ways to do this is to learn from AT peers who use PROs in their practice. Specifically, you'll see how ATs use PROs, what factors influence their use of PROs, and how they feel PROs impact their clinical decision-making and patient outcomes.
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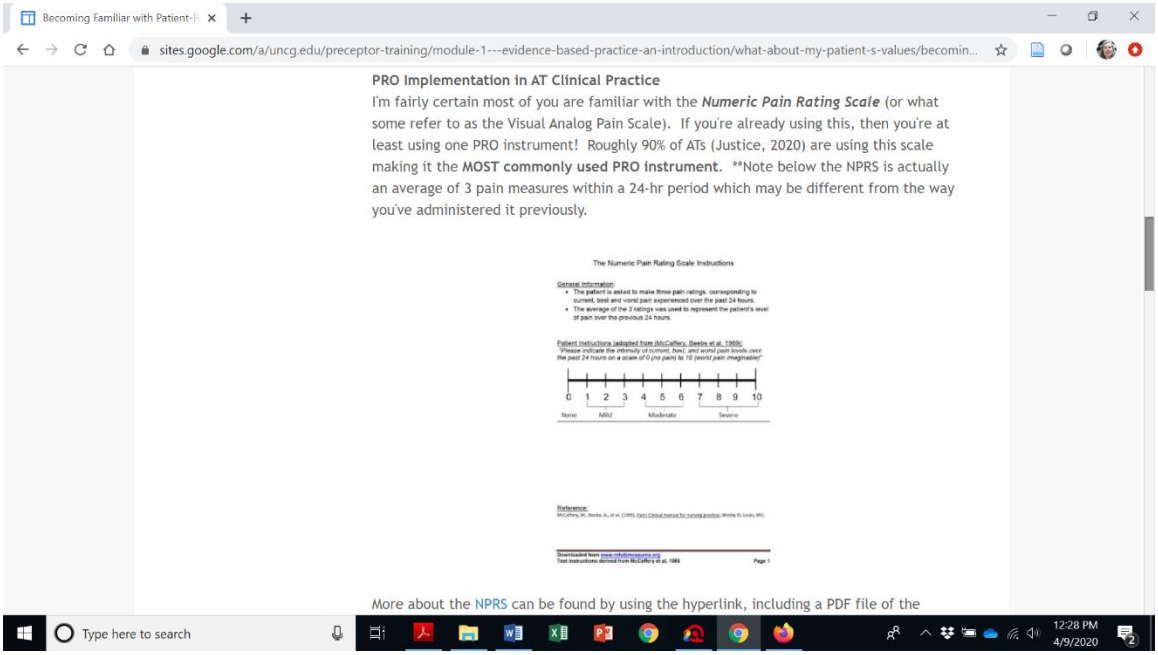
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PRO Implementation in AT Clinical Practice
I'm fairly certain most of you are familiar with the Numeric Pain Rating Scale (or what some refer to as the Visual Analog Pain Scale). If you're already using this, then you're at least using one PRO instrument! Roughly 90% of ATs (Justice, 2020) are using this scale making it the MOST commonly used PRO instrument. **Note below the NPRS is actually an average of 3 pain measures within a 24-hr period which may be different from the way you've administered it previously.
The Numeric Pain Rating Scale Instructions
General Information:
Patient Instructions (adopted from McCaffery, Beebe et al., 1989):
0 1 2 3 4 5 6 7 8 9 10
None
Mild
Moderate
Severe
Reference:
More about the NPRS can be found by using the hyperlink, including a PDF file of the
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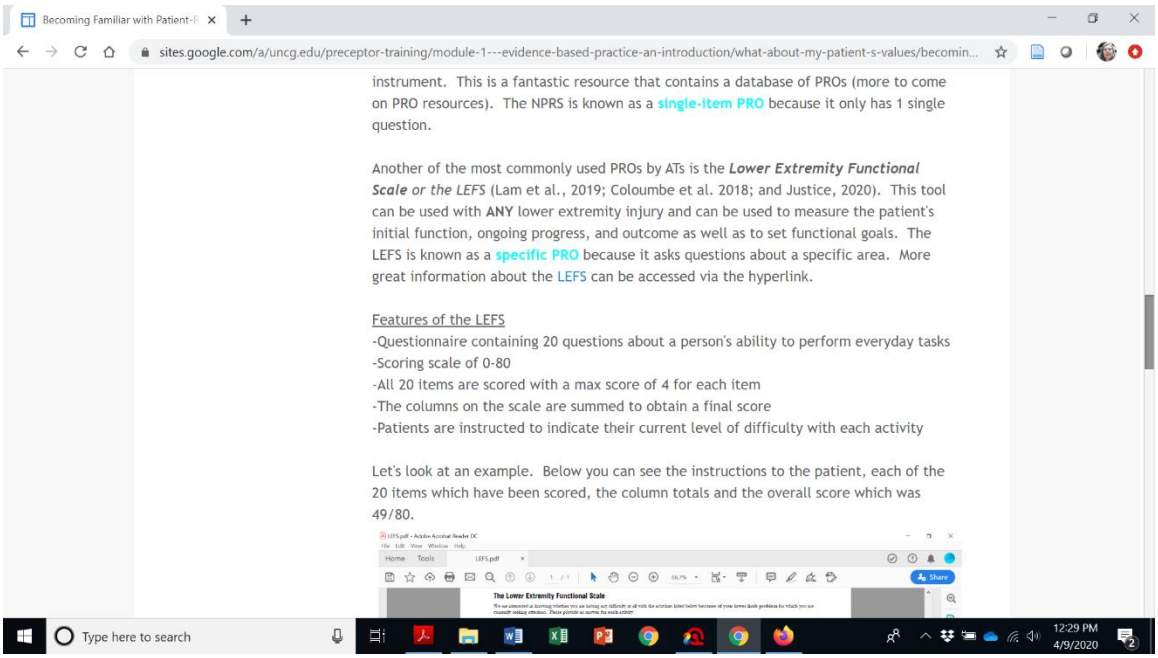
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instrument. This is a fantastic resource that contains a database of PROs (more to come on PRO resources). The NPRS is known as a single-item PRO because it only has 1 single question.
Another of the most commonly used PROs by ATs is the Lower Extremity Functional Scale or the LEFS (Lam et al., 2019; Coloumbe et al. 2018; and Justice, 2020). This tool can be used with ANY lower extremity injury and can be used to measure the patient's initial function, ongoing progress, and outcome as well as to set functional goals. The LEFS is known as a specific PRO because it asks questions about a specific area. More great information about the LEFS can be accessed via the hyperlink.
Features of the LEFS
-Questionnaire containing 20 questions about a person's ability to perform everyday tasks
-Scoring scale of 0-80
-All 20 items are scored with a max score of 4 for each item
-The columns on the scale are summed to obtain a final score
-Patients are instructed to indicate their current level of difficulty with each activity
Let's look at an example. Below you can see the instructions to the patient, each of the 20 items which have been scored, the column totals and the overall score which was 49/80.
The Lower Extremity Functional Scale
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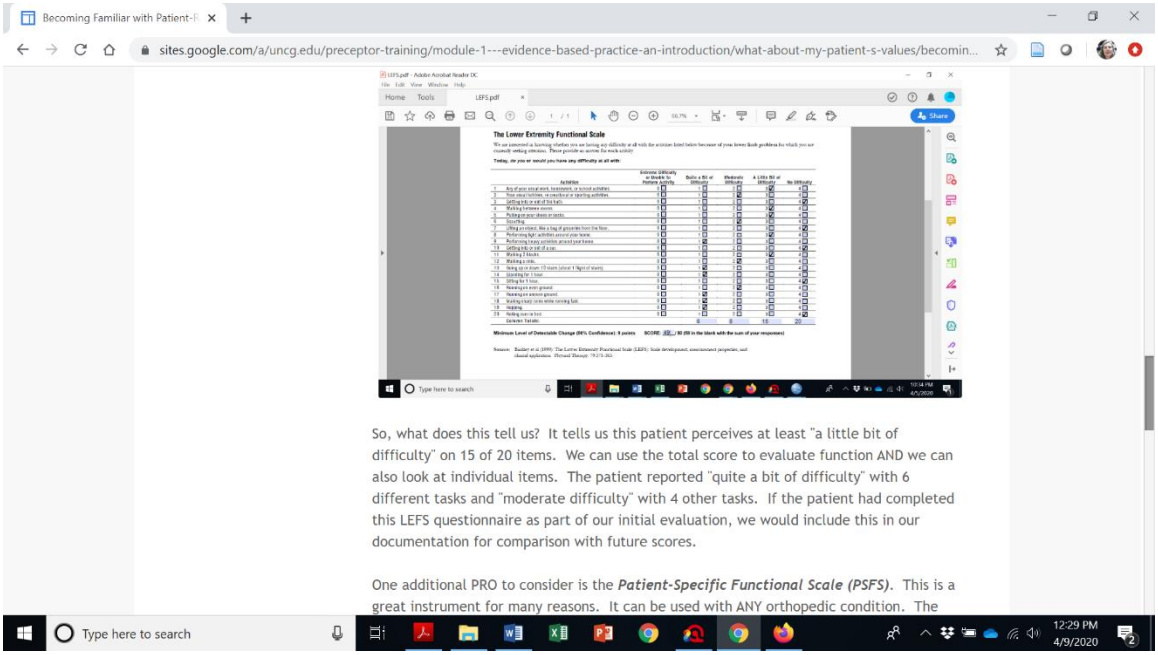
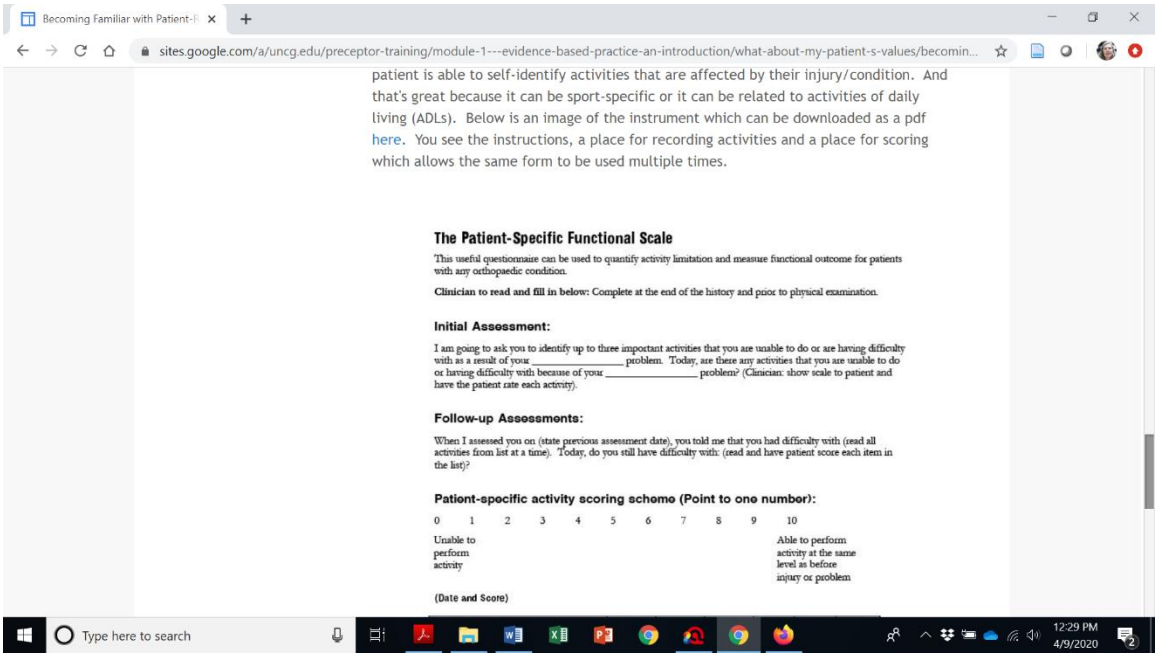


So, what does this tell us? It tells us this patient perceives at least "a little bit of difficulty" on 15 of 20 items. We can use the total score to evaluate function AND we can also look at individual items. The patient reported "quite a bit of difficulty" with 6 different tasks and "moderate difficulty" with 4 other tasks. If the patient had completed this LEFS questionnaire as part of our initial evaluation, we would include this in our documentation for comparison with future scores.

One additional PRO to consider is the ***Patient-Specific Functional Scale (PSFS)***. This is a great instrument for many reasons. It can be used with ANY orthopedic condition. The



patient is able to self-identify activities that are affected by their injury/condition. And that's great because it can be sport-specific or it can be related to activities of daily living (ADLs). Below is an image of the instrument which can be downloaded as a pdf here. You see the instructions, a place for recording activities and a place for scoring which allows the same form to be used multiple times.

The Patient-Specific Functional Scale

This useful questionnaire can be used to quantify activity limitation and measure functional outcome for patients with any orthopaedic condition.

Clinician to read and fill in below: Complete at the end of the history and prior to physical examination.

Initial Assessment:

I am going to ask you to identify up to three important activities that you are unable to do or are having difficulty with as a result of your _____ problem. Today, are there any activities that you are unable to do or having difficulty with because of your _____ problem? (Clinician: show scale to patient and have the patient rate each activity).

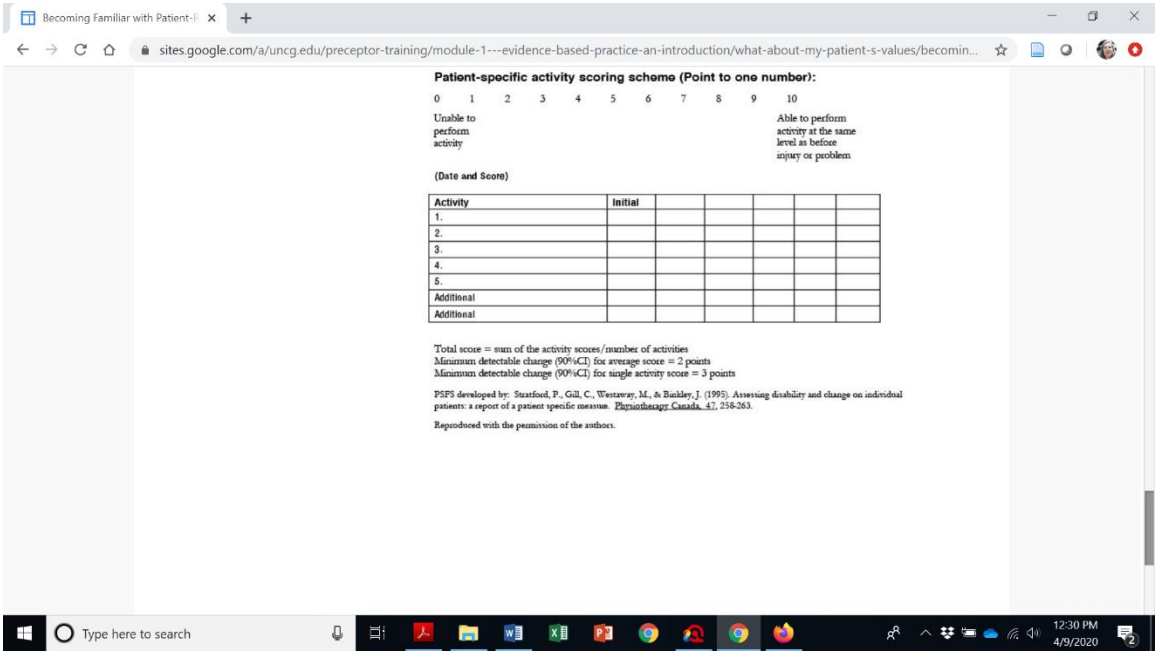
Follow-up Assessments:

When I assessed you on (state previous assessment date), you told me that you had difficulty with (read all activities from list at a time). Today, do you still have difficulty with: (read and have patient score each item in the list)?

Patient-specific activity scoring scheme (Point to one number):

0	1	2	3	4	5	6	7	8	9	10
Unable to perform activity										Able to perform activity at the same level as before injury or problem

(Date and Score)



Patient-specific activity scoring scheme (Point to one number):

0 1 2 3 4 5 6 7 8 9 10

Unable to perform activity

Able to perform activity at the same level as before injury or problem

(Date and Score)

Activity	Initial					
1.						
2.						
3.						
4.						
5.						
Additional						
Additional						

Total score = sum of the activity scores/number of activities
Minimum detectable change (90%CI) for average score = 2 points
Minimum detectable change (90%CI) for single activity score = 3 points

PSFS developed by: Stratford, P., Gill, C., Westaway, M., & Binkley, J. (1995). Assessing disability and change on individual patients: a report of a patient specific measure. Physiotherapy Canada, 47, 258-263.

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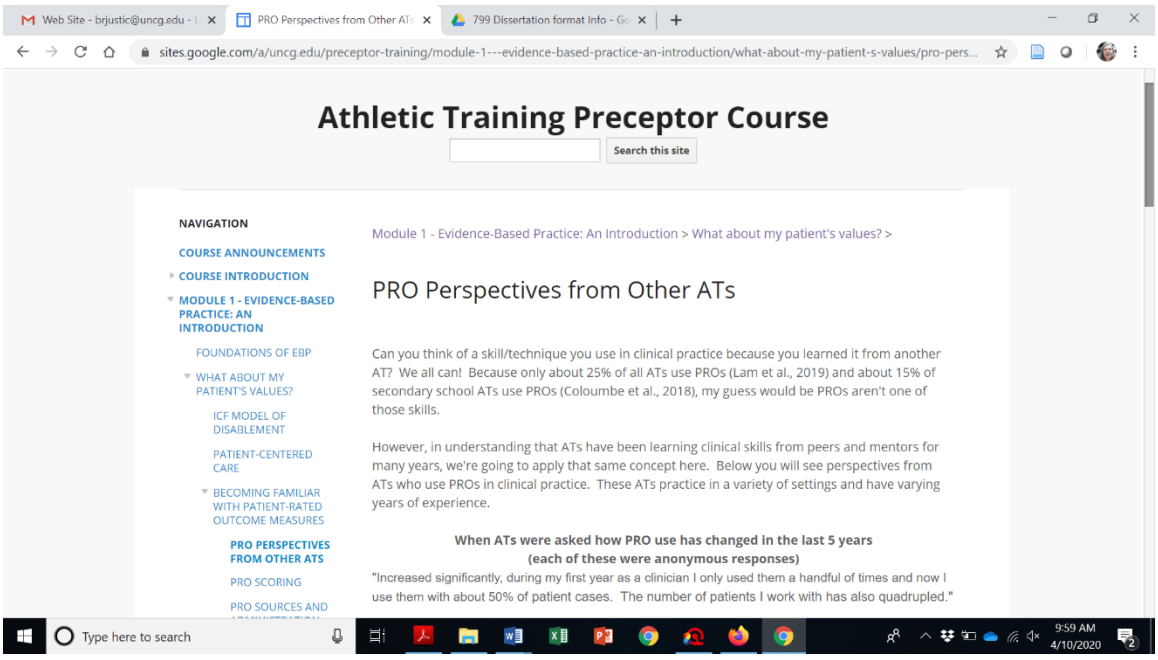

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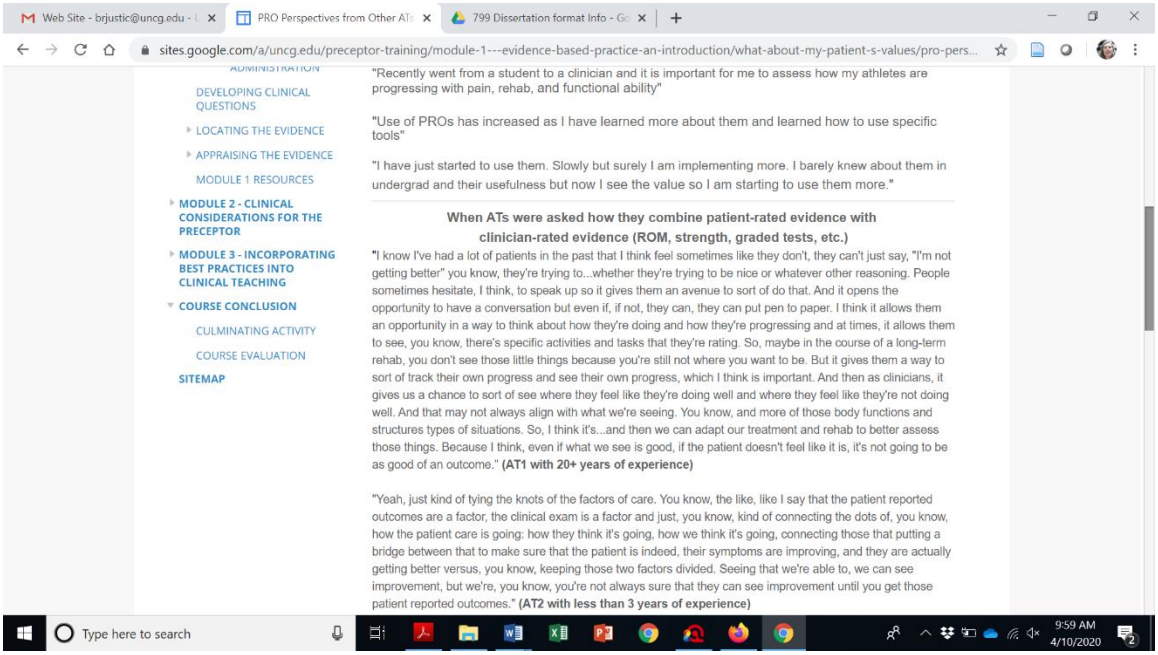
PRO Perspectives from Other ATs

Can you think of a skill/technique you use in clinical practice because you learned it from another AT? We all can! Because only about 25% of all ATs use PROs (Lam et al., 2019) and about 15% of secondary school ATs use PROs (Coloumbe et al., 2018), my guess would be PROs aren't one of those skills.

However, in understanding that ATs have been learning clinical skills from peers and mentors for many years, we're going to apply that same concept here. Below you will see perspectives from ATs who use PROs in clinical practice. These ATs practice in a variety of settings and have varying years of experience.

When ATs were asked how PRO use has changed in the last 5 years
(each of these were anonymous responses)

"Increased significantly, during my first year as a clinician I only used them a handful of times and now I use them with about 50% of patient cases. The number of patients I work with has also quadrupled."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"Recently went from a student to a clinician and it is important for me to assess how my athletes are progressing with pain, rehab, and functional ability"
"Use of PROs has increased as I have learned more about them and learned how to use specific tools"
"I have just started to use them. Slowly but surely I am implementing more. I barely knew about them in undergrad and their usefulness but now I see the value so I am starting to use them more."
When ATs were asked how they combine patient-rated evidence with clinician-rated evidence (ROM, strength, graded tests, etc.)
"I know I've had a lot of patients in the past that I think feel sometimes like they don't, they can't just say, "I'm not getting better" you know, they're trying to...whether they're trying to be nice or whatever other reasoning. People sometimes hesitate, I think, to speak up so it gives them an avenue to sort of do that. And it opens the opportunity to have a conversation but even if, if not, they can, they can put pen to paper. I think it allows them an opportunity in a way to think about how they're doing and how they're progressing and at times, it allows them to see, you know, there's specific activities and tasks that they're rating. So, maybe in the course of a long-term rehab, you don't see those little things because you're still not where you want to be. But it gives them a way to sort of track their own progress and see their own progress, which I think is important. And then as clinicians, it gives us a chance to sort of see where they feel like they're doing well and where they feel like they're not doing well. And that may not always align with what we're seeing. You know, and more of those body functions and structures types of situations. So, I think it's...and then we can adapt our treatment and rehab to better assess those things. Because I think, even if what we see is good, if the patient doesn't feel like it is, it's not going to be as good of an outcome." (AT1 with 20+ years of experience)
"Yeah, just kind of tying the knots of the factors of care. You know, the like, like I say that the patient reported outcomes are a factor, the clinical exam is a factor and just, you know, kind of connecting the dots of, you know, how the patient care is going: how they think it's going, how we think it's going, connecting those that putting a bridge between that to make sure that the patient is indeed, their symptoms are improving, and they are actually getting better versus, you know, keeping those two factors divided. Seeing that we're able to, we can see improvement, but we're, you know, you're not always sure that they can see improvement until you get those patient reported outcomes." (AT2 with less than 3 years of experience)
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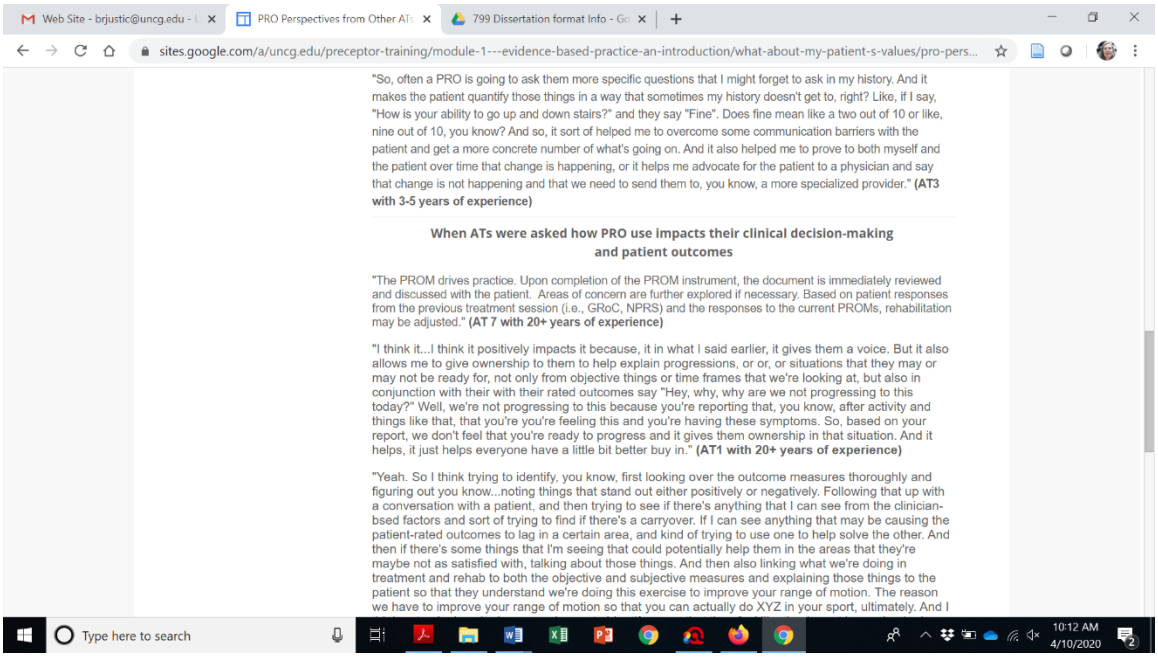
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"So, often a PRO is going to ask them more specific questions that I might forget to ask in my history. And it makes the patient quantify those things in a way that sometimes my history doesn't get to, right? Like, if I say, "How is your ability to go up and down stairs?" and they say "Fine". Does fine mean like a two out of 10 or like, nine out of 10, you know? And so, it sort of helped me to overcome some communication barriers with the patient and get a more concrete number of what's going on. And it also helped me to prove to both myself and the patient over time that change is happening, or it helps me advocate for the patient to a physician and say that change is not happening and that we need to send them to, you know, a more specialized provider." (AT3 with 3-5 years of experience)
When ATs were asked how PRO use impacts their clinical decision-making and patient outcomes
"The PROM drives practice. Upon completion of the PROM instrument, the document is immediately reviewed and discussed with the patient. Areas of concern are further explored if necessary. Based on patient responses from the previous treatment session (i.e., GRoC, NPRS) and the responses to the current PROMs, rehabilitation may be adjusted." (AT 7 with 20+ years of experience)
"I think it...I think it positively impacts it because, it in what I said earlier, it gives them a voice. But it also allows me to give ownership to them to help explain progressions, or or, or situations that they may or may not be ready for, not only from objective things or time frames that we're looking at, but also in conjunction with their with their rated outcomes say "Hey, why, why are we not progressing to this today?" Well, we're not progressing to this because you're reporting that, you know, after activity and things like that, that you're you're feeling this and you're having these symptoms. So, based on your report, we don't feel that you're ready to progress and it gives them ownership in that situation. And it helps, it just helps everyone have a little bit better buy in." (AT1 with 20+ years of experience)
"Yeah. So I think trying to identify, you know, first looking over the outcome measures thoroughly and figuring out you know...noting things that stand out either positively or negatively. Following that up with a conversation with a patient, and then trying to see if there's anything that I can see from the clinician-bsed factors and sort of trying to find if there's a carryover. If I can see anything that may be causing the patient-rated outcomes to lag in a certain area, and kind of trying to use one to help solve the other. And then if there's some things that I'm seeing that could potentially help them in the areas that they're maybe not as satisfied with, talking about those things. And then also linking what we're doing in treatment and rehab to both the objective and subjective measures and explaining those things to the patient so that they understand we're doing this exercise to improve your range of motion. The reason we have to improve your range of motion so that you can actually do XYZ in your sport, ultimately. And I
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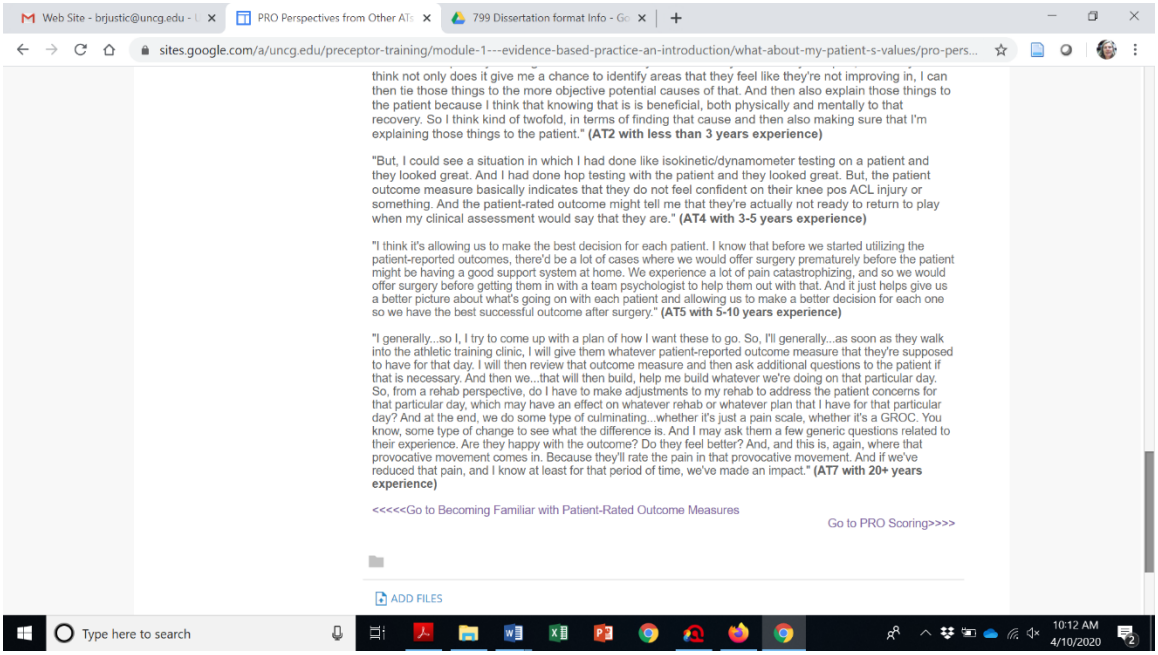
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think not only does it give me a chance to identify areas that they feel like they're not improving in, I can then tie those things to the more objective potential causes of that. And then also explain those things to the patient because I think that knowing that is is beneficial, both physically and mentally to that recovery. So I think kind of twofold, in terms of finding that cause and then also making sure that I'm explaining those things to the patient." (AT2 with less than 3 years experience)
"But, I could see a situation in which I had done like isokinetic/dynamometer testing on a patient and they looked great. And I had done hop testing with the patient and they looked great. But, the patient outcome measure basically indicates that they do not feel confident on their knee pos ACL injury or something. And the patient-rated outcome might tell me that they're actually not ready to return to play when my clinical assessment would say that they are." (AT4 with 3-5 years experience)
"I think it's allowing us to make the best decision for each patient. I know that before we started utilizing the patient-reported outcomes, there'd be a lot of cases where we would offer surgery prematurely before the patient might be having a good support system at home. We experience a lot of pain catastrophizing, and so we would offer surgery before getting them in with a team psychologist to help them out with that. And it just helps give us a better picture about what's going on with each patient and allowing us to make a better decision for each one so we have the best successful outcome after surgery." (AT5 with 5-10 years experience)
"I generally...so I, I try to come up with a plan of how I want these to go. So, I'll generally...as soon as they walk into the athletic training clinic, I will give them whatever patient-reported outcome measure that they're supposed to have for that day. I will then review that outcome measure and then ask additional questions to the patient if that is necessary. And then we...that will then build, help me build whatever we're doing on that particular day. So, from a rehab perspective, do I have to make adjustments to my rehab to address the patient concerns for that particular day, which may have an effect on whatever rehab or whatever plan that I have for that particular day? And at the end, we do some type of culminating...whether it's just a pain scale, whether it's a GROC. You know, some type of change to see what the difference is. And I may ask them a few generic questions related to their experience. Are they happy with the outcome? Do they feel better? And, and this is, again, where that provocative movement comes in. Because they'll rate the pain in that provocative movement. And if we've reduced that pain, and I know at least for that period of time, we've made an impact." (AT7 with 20+ years experience)
<<<<<Go to Becoming Familiar with Patient-Rated Outcome Measures
Go to PRO Scoring>>>>
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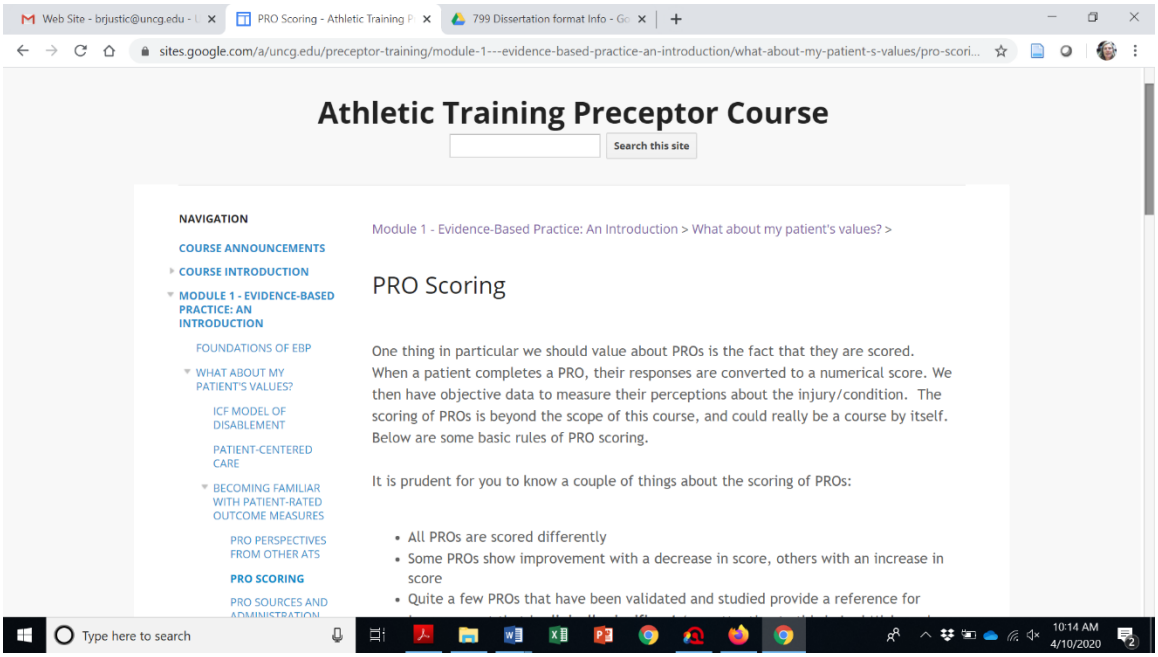
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PRO Scoring
One thing in particular we should value about PROs is the fact that they are scored. When a patient completes a PRO, their responses are converted to a numerical score. We then have objective data to measure their perceptions about the injury/condition. The scoring of PROs is beyond the scope of this course, and could really be a course by itself. Below are some basic rules of PRO scoring.
It is prudent for you to know a couple of things about the scoring of PROs:
All PROs are scored differently
Some PROs show improvement with a decrease in score, others with an increase in score
Quite a few PROs that have been validated and studied provide a reference for
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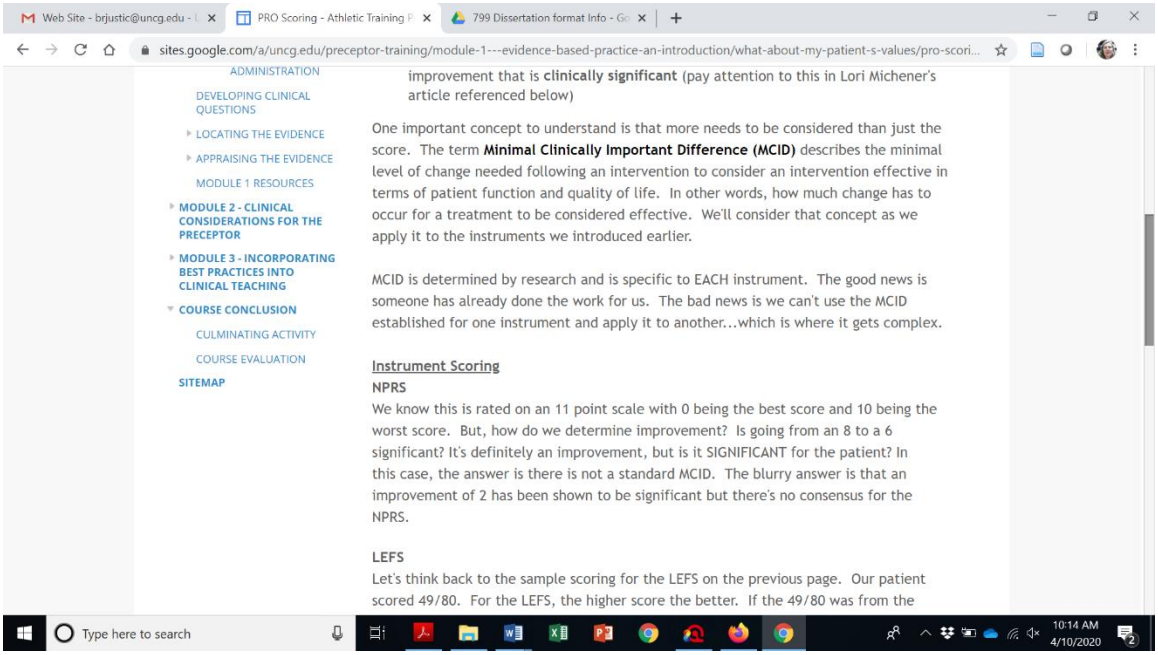
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improvement that is clinically significant (pay attention to this in Lori Michener's article referenced below)
One important concept to understand is that more needs to be considered than just the score. The term Minimal Clinically Important Difference (MCID) describes the minimal level of change needed following an intervention to consider an intervention effective in terms of patient function and quality of life. In other words, how much change has to occur for a treatment to be considered effective. We'll consider that concept as we apply it to the instruments we introduced earlier.
MCID is determined by research and is specific to EACH instrument. The good news is someone has already done the work for us. The bad news is we can't use the MCID established for one instrument and apply it to another...which is where it gets complex.
Instrument Scoring
NPRS
We know this is rated on an 11 point scale with 0 being the best score and 10 being the worst score. But, how do we determine improvement? Is going from an 8 to a 6 significant? It's definitely an improvement, but is it SIGNIFICANT for the patient? In this case, the answer is there is not a standard MCID. The blurry answer is that an improvement of 2 has been shown to be significant but there's no consensus for the NPRS.
LEFS
Let's think back to the sample scoring for the LEFS on the previous page. Our patient scored 49/80. For the LEFS, the higher score the better. If the 49/80 was from the
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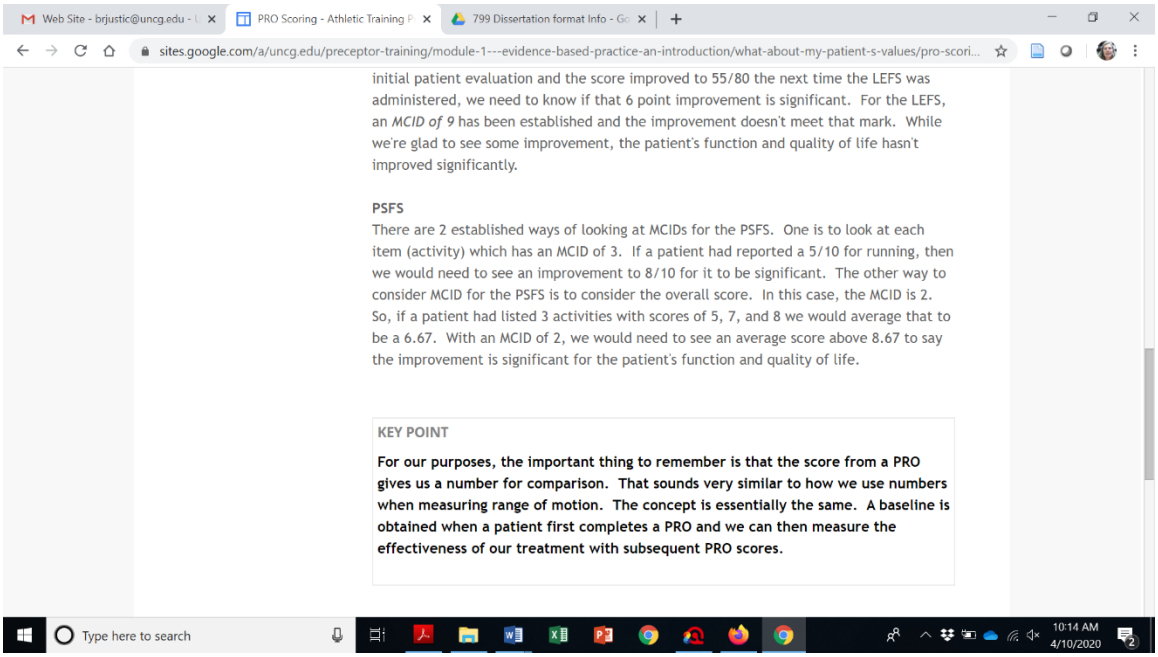
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initial patient evaluation and the score improved to 55/80 the next time the LEFS was administered, we need to know if that 6 point improvement is significant. For the LEFS, an MCID of 9 has been established and the improvement doesn't meet that mark. While we're glad to see some improvement, the patient's function and quality of life hasn't improved significantly.
PSFS
There are 2 established ways of looking at MCIDs for the PSFS. One is to look at each item (activity) which has an MCID of 3. If a patient had reported a 5/10 for running, then we would need to see an improvement to 8/10 for it to be significant. The other way to consider MCID for the PSFS is to consider the overall score. In this case, the MCID is 2. So, if a patient had listed 3 activities with scores of 5, 7, and 8 we would average that to be a 6.67. With an MCID of 2, we would need to see an average score above 8.67 to say the improvement is significant for the patient's function and quality of life.
KEY POINT
For our purposes, the important thing to remember is that the score from a PRO gives us a number for comparison. That sounds very similar to how we use numbers when measuring range of motion. The concept is essentially the same. A baseline is obtained when a patient first completes a PRO and we can then measure the effectiveness of our treatment with subsequent PRO scores.
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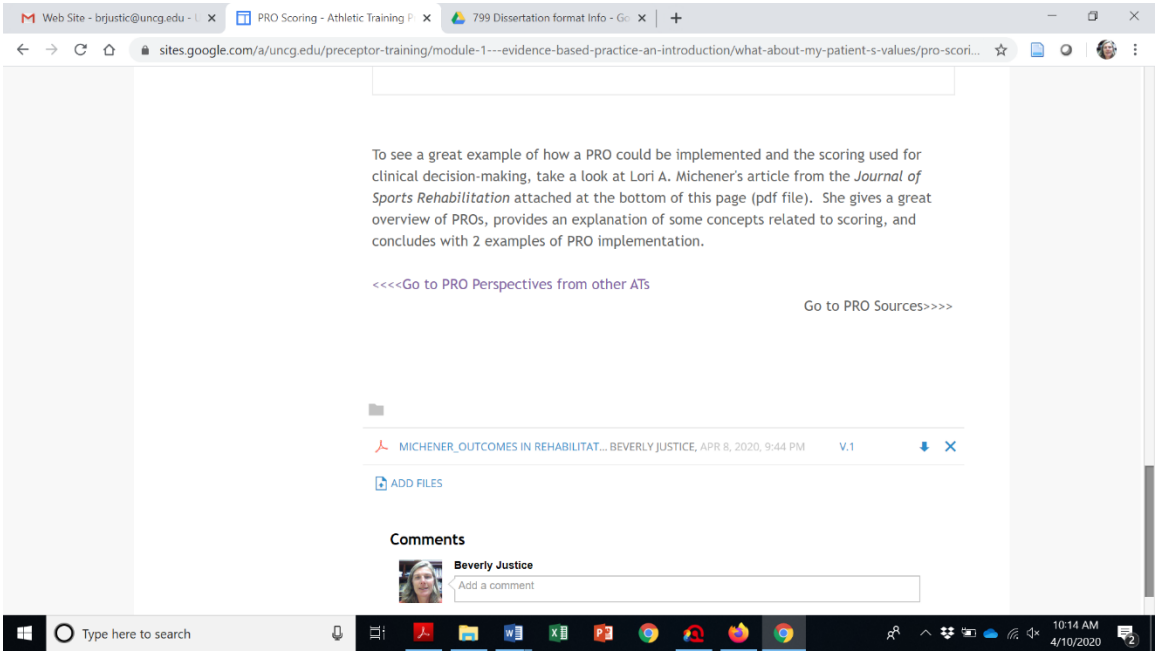
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To see a great example of how a PRO could be implemented and the scoring used for clinical decision-making, take a look at Lori A. Michener's article from the Journal of Sports Rehabilitation attached at the bottom of this page (pdf file). She gives a great overview of PROs, provides an explanation of some concepts related to scoring, and concludes with 2 examples of PRO implementation.
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Go to PRO Sources>>>>
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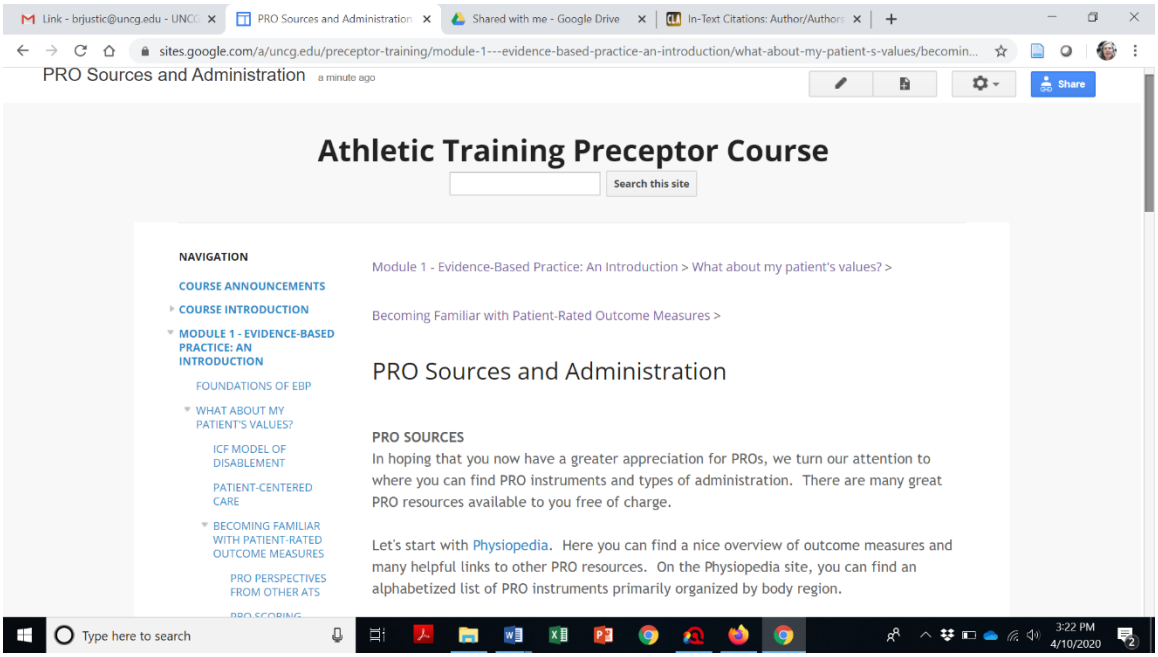
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PRO Sources and Administration
PRO SOURCES
In hoping that you now have a greater appreciation for PROs, we turn our attention to where you can find PRO instruments and types of administration. There are many great PRO resources available to you free of charge.
Let's start with Physiopedia. Here you can find a nice overview of outcome measures and many helpful links to other PRO resources. On the Physiopedia site, you can find an alphabetized list of PRO instruments primarily organized by body region.
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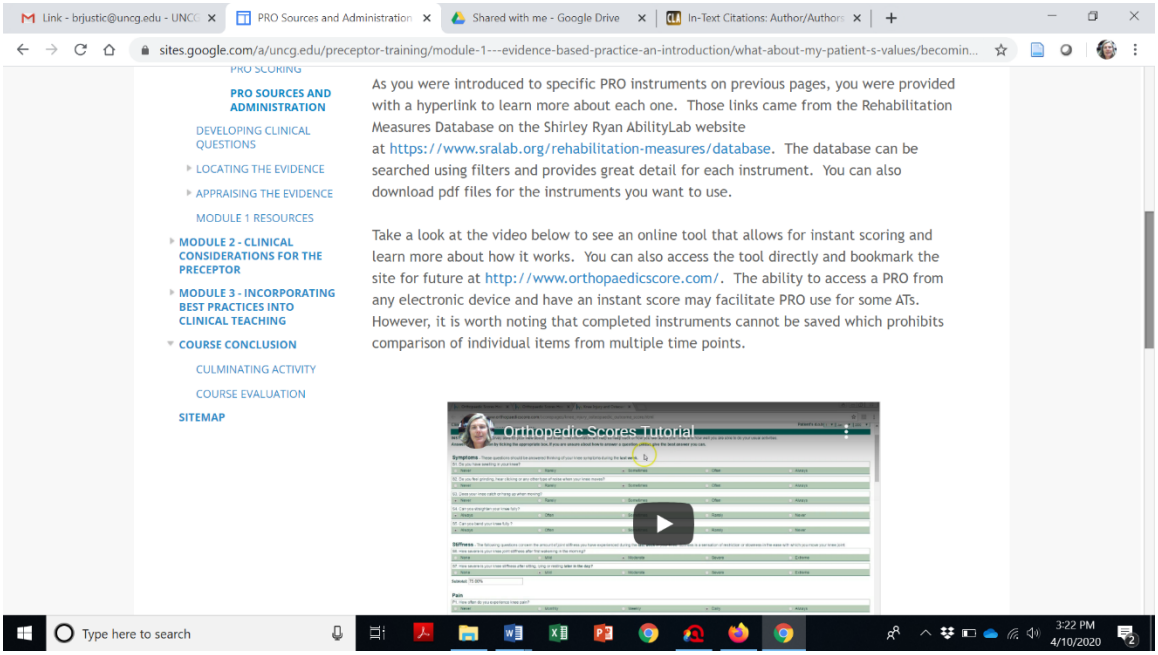
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As you were introduced to specific PRO instruments on previous pages, you were provided with a hyperlink to learn more about each one. Those links came from the Rehabilitation Measures Database on the Shirley Ryan AbilityLab website at https://www.sralab.org/rehabilitation-measures/database. The database can be searched using filters and provides great detail for each instrument. You can also download pdf files for the instruments you want to use.
Take a look at the video below to see an online tool that allows for instant scoring and learn more about how it works. You can also access the tool directly and bookmark the site for future at http://www.orthopaedicscore.com/. The ability to access a PRO from any electronic device and have an instant score may facilitate PRO use for some ATs. However, it is worth noting that completed instruments cannot be saved which prohibits comparison of individual items from multiple time points.
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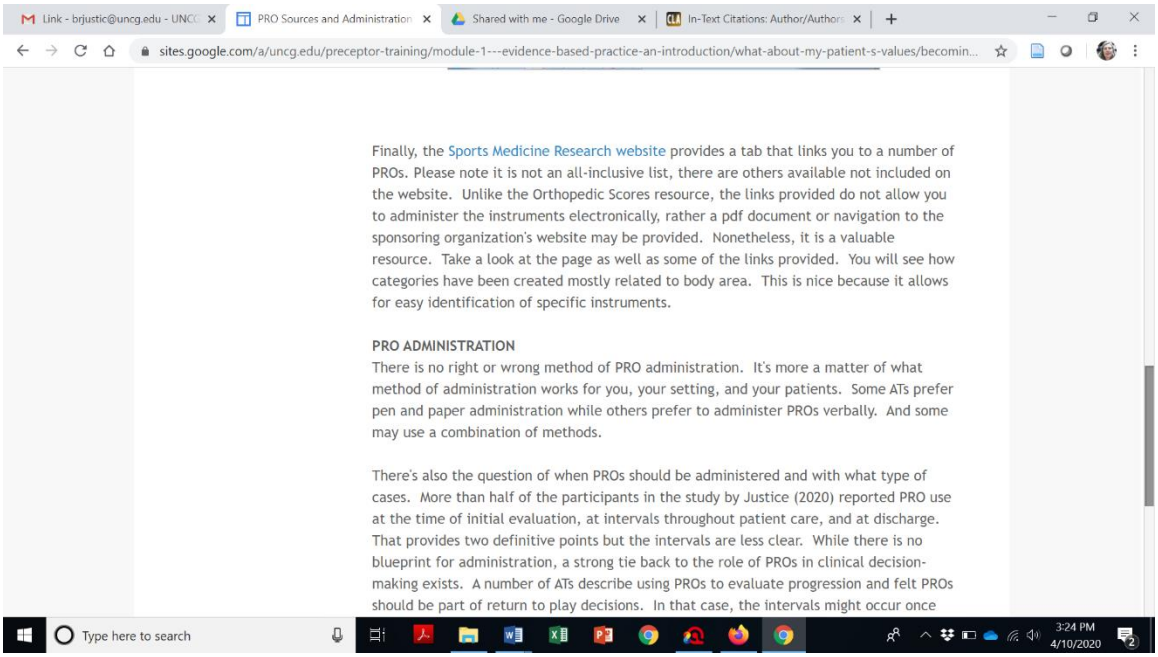
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Finally, the Sports Medicine Research website provides a tab that links you to a number of PROs. Please note it is not an all-inclusive list, there are others available not included on the website. Unlike the Orthopedic Scores resource, the links provided do not allow you to administer the instruments electronically, rather a pdf document or navigation to the sponsoring organization's website may be provided. Nonetheless, it is a valuable resource. Take a look at the page as well as some of the links provided. You will see how categories have been created mostly related to body area. This is nice because it allows for easy identification of specific instruments.
PRO ADMINISTRATION
There is no right or wrong method of PRO administration. It's more a matter of what method of administration works for you, your setting, and your patients. Some ATs prefer pen and paper administration while others prefer to administer PROs verbally. And some may use a combination of methods.
There's also the question of when PROs should be administered and with what type of cases. More than half of the participants in the study by Justice (2020) reported PRO use at the time of initial evaluation, at intervals throughout patient care, and at discharge. That provides two definitive points but the intervals are less clear. While there is no blueprint for administration, a strong tie back to the role of PROs in clinical decision-making exists. A number of ATs describe using PROs to evaluate progression and felt PROs should be part of return to play decisions. In that case, the intervals might occur once
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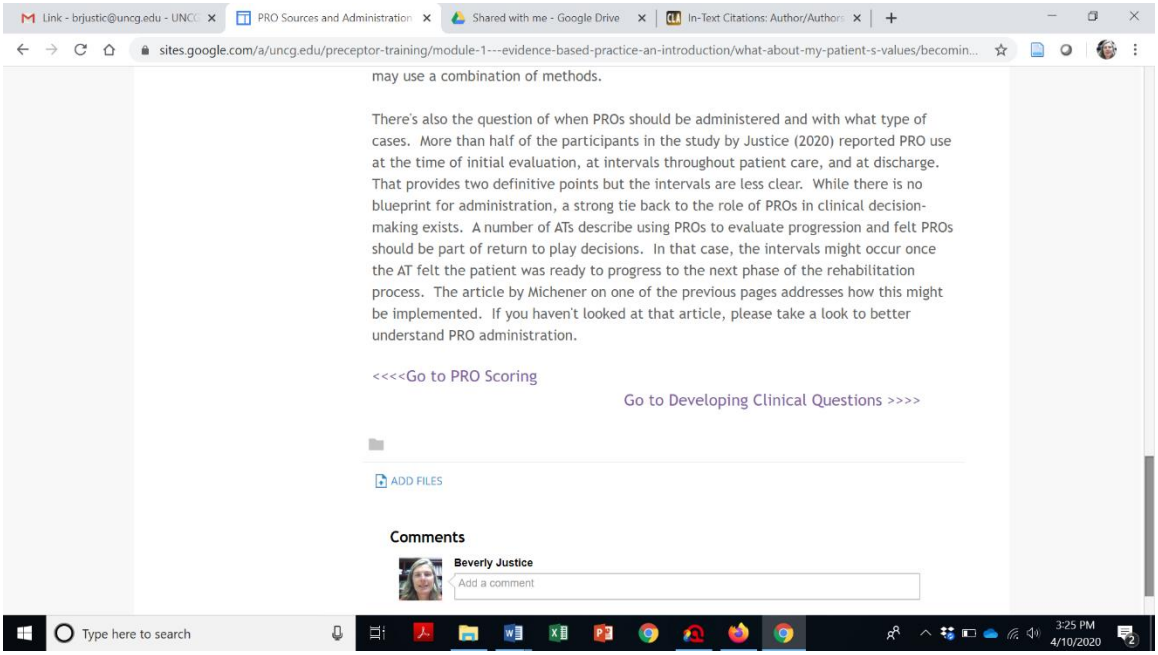
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